The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1688.—Vol. XXXVII. LONDON, SATURDAY, DECEMBER 28, 1867. (WITH SUPPLEMENT) {STAMPED ....SIXPENCE UNSTAMPED..FIVEPENCE

FIG. 1.

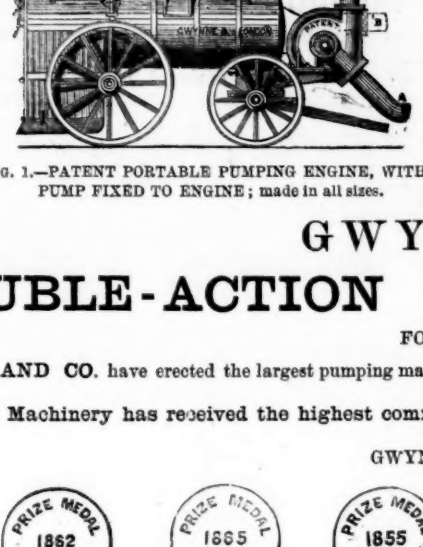

FIG. 1.—PATENT PORTABLE PUMPING ENGINE, WITH PUMP FIXED TO ENGINE; made in all sizes.

FIG. 2.

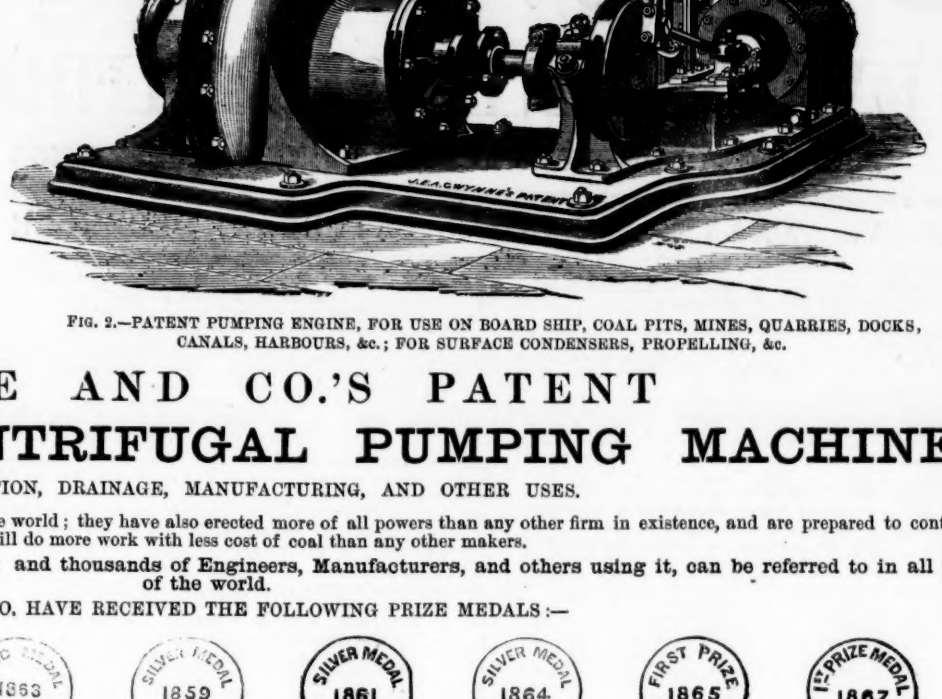

FIG. 2.—PATENT PUMPING ENGINE, FOR USE ON BOARD SHIP, COAL PITS, MINES, QUARRIES, DOCKS, CANALS, HARBOURS, &c.; FOR SURFACE CONDENSERS, PROPELLING, &c.

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They are quite unequalled, and will be found to excel all other arrangements, discharging a body of water in proportion to the lift, the speed of engines and power remaining the same; they will empty a dock in a shorter time and with much less power than is requisite with any other system. The first cost of machinery, the erection, and the foundations and brickwork necessary, are much less expensive than with any other arrangement, and the cost of keeping in thorough working order is merely nominal.

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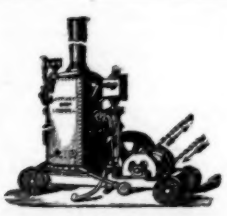
For Single Cylinder Portable Steam Engine,—THE FIRST PRIZE OF £25.
For Double Cylinder Portable Steam Engine,—THE FIRST PRIZE OF £25.
For Horizontal Cylinder Fixed Engine,—THE FIRST PRIZE OF £20.
For Double Blast Finishing Thrashing Machine,—THE PRIZE OF £15.
Also, THE SOCIETY'S SILVER MEDAL for Adjusting Blocks for Machines;
PARIS EXHIBITION, 1867, GOLD MEDAL.

The duty performed by all CLAYTON, SHUTTLEWORTH, and Co.'s Engines on this occasion considerably exceeded that of any others, and has never been equalled at ANY of the trials of the Society. CLAYTON, SHUTTLEWORTH, and Co. refer with pleasure to the fact that the duty of their "Commercial" or single valve engine at Chester, so long ago as 1858, was not equalled by any "ordinary" Engine at Bury.

CLAYTON, SHUTTLEWORTH, & CO., LINCOLN; and 78, LOMBARD STREET, LONDON.



BARROW LIFT, HOISTING, OR DECK ENGINES.

PARIS EXHIBITION, 1867—AWARDS, } Silver Medal for STEAM CRANES. Bronze Medal for DONKEY FEED PUMPS.

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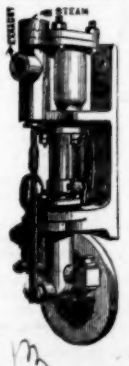
EMERSON STREET, SOUTHWARK,
LONDON, S.E.,

Engineers and Patentees of STEAM CRANES, DONKEY PUMPS, &c.



PATENT DONKEY PUMPS.

Ram	1¼ in.	2 in.	2¼ in.	2½ in.	2¾ in.	3 in.	3¼ in.	3½ in.	4 in.
*Gall. per hour..	230	400	630	850	1200	1500	2100	2500	2800
Approx. H.P.	15	25	40	50	80	95	130	150	230
Price	£10 5s	£12 10s	£15	£18	£21	£24	£ 28	£30	£35

* Calculated at 200 strokes per minute.

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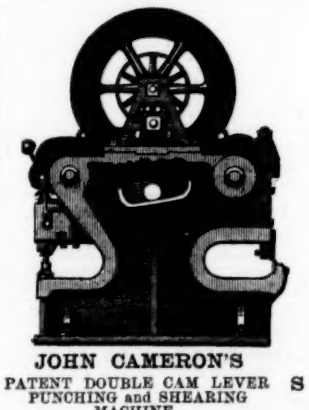
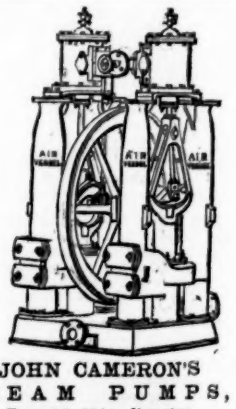
BEST CONDITION — HONORIS CAUSA

BICKFORD, SMITH, AND CO., of TUCKINGMILL, CORNWALL, MANUFACTURERS of PATENT SAFETY-FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—

EVERY COIL of FUSE MANUFACTURED by them has TWO SEPARATE THREADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as THEIR TRADE MARK.



JOHN CAMERON'S
PATENT DOUBLE CAM LEVER PUNCHING and SHEARING MACHINE,
1¼ × 1¼ in. × 24 in.—8 tons, £185.
WORKS,
EGERTON STREET, HULME, MANCHESTER.



JOHN CAMERON'S
STEAM PUMPS,
From 2 to 12 in. diameter,
SINGLE AND DOUBLE-ACTING.
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BLISTER STEEL,
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FILES MARKED
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IMPROVED PNEUMATIC TUNNELLING ENGINE.

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Preference will be given to ADIT LEVELS and those places where ROTATORY MACHINERY is in use, and can be applied to driving the AIR COMPRESSOR.

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Original Correspondence.

MINE INSPECTION, AND CIVIL SERVICE EXAMINATION.

SIR,—I have read with considerable attention and interest the very excellent letter from "Nemo," on "Mine Inspection—Civil Service Examination," in the Journal of Dec. 7. During the short time that the late much esteemed and lamented gentleman the Inspector for Northumberland, Cumberland, and North Durham held his appointment, I had frequent intercourse with coalowners and viewers from all parts of the kingdom, and I heard only one class of remarks—that however amiable and gentleman-like a young man he might be, yet he *was* a "*very young man*"—not more, *I think*, than 24 or 25 years of age—and, consequently, not fitted, either by long practical knowledge of mining or of the ways of the world, to hold so important an office as Inspector of Mines. I have no doubt that he was highly educated and accomplished, and thoroughly conversant with all the qualifications for passing a "Civil Service Examination."

It may not be considered seemly for me to dwell, after his death, upon these matters, or upon the political influence brought to bear in favour of his appointment; but, upon so very serious a question, I cannot help mentioning that it was well known his appointment met with the approval of, and was, indeed, urged by, many influential persons in the North of England; not omitting eminent colliery viewers, of more years actual experience in mining than he had lived from his birth. Could it be expected, therefore, that he could carry out any improvement, or effect any alteration, if opposed by men of very long standing in their profession? Or could he have any influence upon the great bulk of the underviewers and others, many of whom would only look upon him as the pupil which he had but so recently been.

It had been hoped by numbers of persons who think inspection is far too serious a matter to be trifled with, and thrown into disrepute by improper appointments, that for the future none but men with some years over their head, and who had *long actual responsible management* of important collieries, would go forth publicly to the world endorsed with the sanction of the Secretary of State as being competent to watch over the means adopted for the protection of the lives and limbs of the miners in their respective districts, and to fight the battles, which every Inspector must have to fight, with the ignorant or prejudiced owners and agents who are to be met with in every coal field.

I believe that the two gentlemen whose names have been mentioned, one after the other, as having been nominated for an inspectorship had had actual practical experience, and some acquaintance with human nature. I know, from my own personal knowledge, it was the case with one of them. I also know that there are many men most fully qualified, from their practical mining knowledge, to become Inspectors, and who could not pass a Civil Service examination of the present day, as it has been described to me.

I have been asked, at various times, whether I would not recommend that *all persons* shall pass an examination before they were entrusted with any management of collieries. To this I have always replied that, however feasible such a course may appear to those who are not practically acquainted with mining duties, I could not recommend it, inasmuch as many persons *inexperienced in practical mining* would glibly answer a lot of troublesome, but unimportant, questions that good practical men could not do. Let owners of collieries appoint viewers of known experience and good character, and then let these viewers subject their underviewers, overmen, and deputies to such a *common-sense, practical examination* as they—who are the proper judges of what is required underground—think fit. However necessary it may be that every person who is connected with the *ordinary above ground* duties of Govenment offices should be enslaved by the wretched routine of "red tapism," surely *Mining Inspection* ought to be free from such miserable thraldom. Are there no influential members of our Legislature, either Lords or Commons, who can be induced to moot this question publicly, and press for a full and satisfactory explanation why it is deemed requisite that a man should pass a "Civil Service Examination," even if he has not had long practical mining experience? To the uninitiated it appears like the fable of "The Dog and the Shadow," and that in grasping after the *shadow* we lose the *substance*.

It must not, however, be lost sight of that the Home Secretary has made one very judicious appointment of an Inspector of Mines, at a comparatively recent date. The gentleman in question has had a long practical acquaintance with mining, and is, I believe, eminently qualified to *command attention* whenever he may make suggestions or give advice. I understand he had become much respected and admired in Yorkshire, and that great regret is expressed at his removal from the district. No doubt he is in every way a proper person to be an Inspector in the North of England, but can any sane person assert for one moment that there does not require as good a man in Yorkshire as in the North? The public will certainly not be satisfied if a man of great experience is not appointed to have charge of a district which comprises the collieries near Barnsley, where several of the seams of coal, which are now extensively worked, are notoriously as fiery as any that can be found in the kingdom.

The coalowners and viewers have resisted, and very properly so, the appointment of *sub-Inspectors;* but most certainly if men without *great and well-known experience* are made Inspectors, the Home Office will be furnishing the Union delegates with most powerful arguments in favour of some *practical supervision*, and great dissatisfaction will naturally, and properly, prevail amongst the workmen. Suppose, for instance, that another fearful explosion ensues at one of the numerous fiery collieries in the kingdom, and that the Inspector for the time being in that district has not knowledge or influence enough to suggest or carry out an improvement, where, possibly, eminent mining engineers have failed, or to aid by authoritative advice in such a dilemma as now engages the attention of those who have to re-open the Oaks Pit. Why, in such a case an inexperienced Inspector must perforce sit at the council table, and either listen most humbly to the remarks of veterans in mining science and knowledge, and simply endorse everything they say, or make himself appear even more foolish and of less use by hazarding commonplace or silly remarks or suggestions.

For the sake of our mining communities, and of the Home Office, and in the cause of humanity, I urge upon you, Sir, most emphatically to use your best endeavours to arouse the attention of Members of Parliament and others to the importance of this question.

It is perfectly true that the most experienced Inspector or mining engineer of to-day must be a learner as long as he lives; but surely that is no excuse for appointing as Inspectors those who *cannot teach something* at the outset of their career, and have almost everything *to learn;* and this, probably, at the expense of valuable lives sacrificed in the meantime at the shrines of parsimony and ignorance. Depend upon it there is ample scope for experienced Inspectors—aye, and even in greater numbers—to effect improvements and save life, without becoming responsible for the *management* of collieries.

It is perfectly astounding that, in the face of the terrible accidents which have for a time—but, unfortunately, for a *very short time*—absorbed the attention of mining people in the various coal fields, there should at the present time be such an utter want of knowledge, in many cases, of how to take ordinary precautions against explosions and other accidents, and, in many other cases, a want of disposition to act up to what is known. I speak from an acquaintance with many of the districts where serious accidents have occurred, and I have invariable been much struck with the apparent apathy which has prevailed, even in adjoining collieries to those where some fearful loss of life has created a mere "nine days' wonder," which has then been passed, as though each person had quietly folded his hands, and said "I am better than my neighbour; no accident *can happen* to me." If extra precautions, or increased discipline, had prevailed for a time after one of these disasters, this improved state of things has been allowed quietly to die away, unless the Inspector has continued to work unceasingly to prevent such a falling off in good management.

However much the owners of collieries and their managers may be desirous to prevent accidents, and thus protect life, yet there is, and must be, a bias with great numbers towards the production of a large quantity of coals, and at the least possible cost. The owner of colliery A, which has hitherto yielded little or no fire-damp, and the coal is easily and cheaply worked, compares notes with his intimate friend working colliery B, close at hand, and which yields firedamp in large quantities, suddenly, and at very uncertain intervals. B finds that he is paying much more for raising his fuel to bank than A, and cannot obtain a higher price for it in the market. A, who is only acquainted with the circumstances of his own colliery, and does not consult any person having knowledge or influence sufficient to warn him that he may be standing upon a precipice, ridicules B for incurring such needless expense as working with safety-lamps, abolishing blasting, making dumb drifts, and large air-ways, having many officials to *ensure discipline*, &c. B, becomes discontented, complains to his manager or viewer, or whoever he may consult, and *almost insists* that his coal shall be worked as cheaply as his neighbour's. If the manager has not influence—which is frequently the case, from the fact of a class of men being employed who do not like to risk their bread and cheese by a dispute with their master, at the same time "hoping for the best," and that they may escape accidents—then, in case no viewer of position and firmness be consulted, there is a battle for the Inspector to prevent B listening to the voice of the charmer, A.

This is no exaggerated picture of what I know, after a great many years' experience, has occurred in more cases and in more districts than one. Sometimes B has been everruled in his notion to take the advice of A, and has ultimately found that the latter was not the prophet and wise man he considered himself, inasmuch as he did not escape one fearful calamity, but, after spending thousands of pounds in consequence, has then to start and take the precautions that B has been doing successfully. All the arguments and pressure which Inspectors of many years' experience have brought to bear against the class A, have been without avail in inducing him to take greater precautions (which he considered only meant increased cost of production) until the catastrophe befell him.

These things occur again and again in various districts, even after they have been desolated by frightful accidents; such being the case, I ask every person who reads this—and I have no fear of contradiction—whether it would be possible for *any Inspector*, who had not sufficient practical knowledge and confidence in his own age and experience to speak firmly and with great authority, to make head against such a course of procedure, and slay the Dragons of Ignorance, Prejudice, and Self-Interest?

I do not for one moment wish it to be inferred that A and B are the representatives of the great bulk of coalowners in the kingdom, because there are, happily, many to whom the cost of precautions to save the lives of their workmen is never considered or begrudged, and whose collieries hardly need inspection, unless the Inspectors were more able men than their viewers, which is frequently not the case. Unhappily, however, there are numerous representatives of A and B amongst coalowners and managers, and it is to be feared there always will be; consequently there ought to be a body of men as inspectors *who are fully competent to deal with them.*

I fully agree with "Nemo" that the present rate of remuneration is too high for a class of persons who may creep in under the existing system of Civil Service Examination, and it is too low for the proper kind of man.—*Dec.* 19. BETA.

P.S.—Since writing the above, I have seen the letters of "Observer" and "Nemo" in the Supplement to the Journal of Dec. 21. With regard to the former I can only say he does not give a fair description of the mode in which many of the Inspectors fulfil their duties. He either speaks with little or no real knowledge of the subject, or else, which I trust is not the case, wilfully or recklessly maligns many of the gentlemen who now hold the office of Inspectors of Coal Mines. It is quite notorious that several of the Inspectors, past and present, have made it a practice to visit all the collieries in their districts, and that they have done in hundreds of cases where no serious accidents have occurred, either before or after their visits, and in many cases over and over again *before accidents*, and have remonstrated in some cases with the owners and agents, without avail, as to reprehensible practices which they pointed out. Let "Observer" refer carefully to the printed reports of the inspectors since 1850, and he will find such occurrences recorded most frequently.

The various remarks of "Nemo" are, again, very much to the point, and place the subject of examination of candidates for inspectorships in a proper light. It is too notorious that parliamentary, political, and other influences are brought to bear in such cases, and without them I will venture to say that thoroughly practical and experienced mining engineers, who have had upon their own shoulders the entire responsibility of the management of dangerous collieries (not merely under a "chief viewer") will soon find themselves distanced in the race by youths who have friends at their back, and this without reference to what political party is in or out of office. B.

Dec. 21.

MINE INSPECTION.

SIR,—I did hope this week to have written as promised—"of the propriety and necessity, as I think, of appointing additional Inspectors," but the letters on the first page of your Supplement are so interesting (of course, I do not include my own in this category) that I think I cannot do better than make a few remarks on them, and if the subject of additional Inspectors *should* come in for a share of discussion in what follows there will be the less to say about it (by *me*) in any future letter I may write. To one conversant with coal mining, and who endeavours to keep himself *au fait* in all that is transpiring in mining matters, it is no evidence of the importance or magnitude of the subject to find Lord Kinnaird writing upon it; moreover, it does not seem to have been any fault of his lordship that he has had occasion to write upon a subject which he has frequently shown that he knows nothing about. Mr. Nixon seems to have *dragged* him into the matter; however, it serves so far that I can very briefly take notice of his letter in connection with the task which I have set myself—a series of letters, as my time may permit, on Mine Inspection. Lord Kinnaird's letter seems, for the most part, made up of quotations, either from Mr. Nixon or your leader of a recent date, or from "one who has worked his way up from a common miner." I may here observe that his lordship on one occasion, when writing on a question of safety-cages, I think, quoted from an "*eminent authority*," who had been induced to adopt the same, and who previously had a great objection to them, but when appealed to to name the eminent authority, he wrote to one or two gentlemen, asking if they had not written to him to that effect, but never, if I am correctly informed, found who the "eminent authority" was. Probably "one who has worked his way up" is the same gentleman—in fact, Mr. Harris. However, let us see what he says, and in looking at this we will only consider what is *practical* in the quotation, and set aside the jargon as to profits being first consideration, &c.—claptrap all. "The greatest loss of life occurs in winter," says Mr. Harris, and why, why, why? A little big writing follows here, and all of Mr. Harris's persuasion are permitted much latitude in this respect. I think he mostly refers to loss of life by *explosion* in this observation. Let us, then, see how the facts are. The following figures show, from good authority, the number of explosions which have occurred in each month, and the number of deaths caused from the year 1756 up to and including 1850. (Since 1850, when the Mines Inspection Act came into operation, the principal accidents only are included—One in Aug., 34 lives; one in May, 22 lives; and one in March, 74 lives):—

	Explosions.	Lives lost.		Explosions.	Lives lost.
January ..	4	62	July	10	68
February ..	4	20	August	14	173
March	7	143	September ..	12	188
April	12	135	October.....	14	206
May	9	209	November ..	15	183
June	16	396	December....	16	166

In addition to these, two explosions are recorded, in each of which four lives were lost, but the month is not given; and one of the 16 explosions in the month of December has not the number of lives lost stated—"several" is mentioned.

Now, at the first glance at this very black catalogue, it might be supposed that the statement of Lord Kinnaird's correspondent is correct, but an analysis of the numbers of lives lost in each explosion upsets the melodramatic why's, inasmuch as it will be found that in no case of explosion in the month of December has the number of lives lost exceeded 30, unless in the case where "several" is mentioned, which is not probable; and this, surely, would not be the case were the roads, &c., so graphically described by Mr. Harris, neglected to the extent he says, and neglected for the purpose of increasing quantities. Surely, if neglect occurs when large quantities are demanded, wise managers (but, I suppose, there are none with the exception of Lord Kinnaird's correspondent) would make up for such neglect in the summer months, when the demand is not so great. This may be inferred as the correspondent's opinion, I think; and yet, not only have the explosions been as numerous in the midst of summer, but the number of deaths caused thereby have been fearfully greater. Even admitting neglected air-ways in winter (which I am far from doing, under ordinary and *usual* management), it is well known by *practical* men that the difficulties of ventilation in summer are much greater than in winter, ordinarily (in furnace ventilation, which until recently has been the most usual means), by reason of the much higher temperature of the atmosphere, and no doubt this will account, in a great degree, for the explosions in summer being attended with such fearful results (the analysis of my list shows such numbers as 92, 47, 38, &c., in May, and 102, 52, 44, 31, 30, &c., in June).

Lord Kinnaird's letter then speaks of Ansell's Indicator, which seems to be a pet instrument of his lordship's. He states—"One great objection by those connected with mines" to this instrument to be "that the men would not go to work if they saw indicated the amount of dangerous gas in the pit." Mr. Harris, again, *surely. I do not believe there is a manager* (I speak more particularly of the North of England) *who would permit his men to work in a pit in which a dangerous amount of gas had accumulated.* Surely he cannot think we are a body of cut-throats. To put the *objection* to Mr. Ansell's indicator (which is a most ingenious instrument) in a few words, I would say—If a place, or any number of places, are examined, and found to be (say) explosive, of what possible use would it be to know the exact percentage of gas mixed with the air? Or, if a place were found to contain gas in *any degree* dangerous, would any manager permit a man to work in it? Assuredly not. Ansell's indicator has over and over again, in your columns, been proved to be nothing more than an ingenious piece of mechanism, utterly unnecessary, and eminently liable to mislead.

His lordship then moves to ground in which there cannot be any possible objection to his plunging head over heels if he likes. Legislation, Committees, and Commissions—by all means let us have them, and let Lord Kinnaird have the honour of moving for them, and making them useful if he can; but, for goodness sake, let him "stick to his last," and do give up the great occasion of small minds, that when an accident occurs he must "write to the papers," and not only so, but must condemn the whole system of management, of which, it need not be repeated, he knows nothing, and thus get managers into mischief, and increase the distance between employers and workmen. He will always get discontented and uneducated workmen to join in a cry against owners and managers of mines, never mind how untrue or unfair the cry may be—but this will never save a life. It was a sad day for working men when so-called Liberal legislators persuaded them "they were as good as their masters." Pity but Conservative rule of the good old sort had kept its hold, when workmen were at least grateful for any measures taken for their safety or comfort.

But I am trespassing too much on your space. I should have liked to show the fallacious and contradictory arguments of "Observer." Although he flatters me by saying my remarks are to the point, I am sorry to say it is much more than I can say of his. Inspectors *are* useful, even if they only see what has been wrong after an accident occurs. Why, Lord Kinnaird can do that, and, therefore, as Inspectors, always supposing proper ones are appointed, must be of more service than he is, *practically*, when they have opportunities of *seeing* the collieries, which he has not, and when they are acquainted with mining, which he is not.—*Dec.* 24. NEMO.

THE PREVENTION OF GAS EXPLOSIONS IN COLLIERIES, DRAINAGE OF GASES—STATIONARY SAFETY-LAMPS.

SIR,—In a short letter to the *Mining Journal* of April 6, 1861, I pointed out the advisability of establishing a general comprehensive system of draining off dangerous gases, and at the same time I suggested the employment of an explosive gas-conductor, the which conductor would be simply a safety-lamp on a *large scale*, but covered with a *double* casing of wire-gauze, and whose interior (where the flame is) would be connected with the surface or upcasts by means of tubes or pipes, which would serve to carry off the products of combustion of the gases, or keep up a ventilation in the absence of fiery gases. I am afraid that in view of the existence of vast and as yet undeveloped deposits of coal in many parts of the world, a reduction in the extraction of English coal would only tend to stimulate foreign competition in furnishing coal to the whole world, and that such foreign competition would prove very prejudicial to the British trade and shipping interests, and that hence we must be prepared rather for an increase in the rapidity of extraction of coal in England. It has often and ably been indicated by many of your correspondents, that the causes of many explosions are not so much the occurrence of blowers, but the gradual accumulation of dangerous gases in abandoned spaces of a mine, and I venture to be under the impression that the suggestions I made in 1861 deserve the attention of all interested in the prevention of those calamities.

To recapitulate, I should suggest that at certain intervals throughout such parts of a colliery there should be placed permanent sentinels, in the shape of specially constructed large stationary *safety-lamps*, constructed on the principle of the explosive gas conductors above alluded to, and connected with the surface or the upcast shafts by means of pipes or tubes, through which the burnt gases and heated air would flow continually. In extensive and fiery collieries it would be quite worth while incurring the expense of forming the connection of those conductors here and there *directly*, by means of bore-holes or artesian shafts, especially sunk for that purpose. The only additional expense would be the pipes and the keeping a light perpetually burning in each of the stationary safety-lamps. By these means the dangerous gases would be uninterruptedly carried off, and in the case of blowers occurring the increased rush of the hot burnt gas through the pipes would give timely and prompt warning of the danger, while the double covering of wire-gauze would effectually prevent the flame from being communicated to the surrounding gas. Thermometers might be placed in connection with the conducting tubes or pipes, or a contrivance be placed in the tubes, which gives forth sounds, louder in proportion as the rush of heated air is greater, and by this means the fact that fire-damp is burning within one or other of our double-gauzed large stationary safety-lamps would at once be made known throughout the mine.

Dec. 24. G. J. GUNTHER.

THE CAUSE OF THE DEPRESSION IN TRADE.

SIR,—In the Journal of Dec. 14 you published a letter on this subject, or rather a dialogue between a Manchester mechanic and a Liverpool merchant, in which the cause of the depression was attributed to the Exhibition of 1851—by throwing open English manufactures to the world, thereby causing competition, and, according to "Mechanic's" view, ruining British commerce. Now, is there not something between monopoly and ruin? Competition was once called the soul of trade. Our Manchester Mechanic calls it the ruin; according to his theory, if a country has not monopoly she has ruin. Foreign manufactures and engineering has certainly, within the last few years, made rapid progress, but has not the frequent strikes, and the Trades Unions of the English mechanic, done as much, or more, to speed it than the Exhibitions of either 1851 or 1862? Some short time ago Messrs. Schneider, a French firm, were enabled to undersell the English firms in the matter of locomotive engines for our own Great Eastern Railway; and an instance of the effects of Belgian competition on the iron trade of this country has just been afforded in the contracts for the erection of the new St. Thomas's Hospital, on the southern side of the Thames Embankment, London. The contractor, with a desire to afford English manufacturers the first opportunity of supplying the material required for this immense building, asked for tenders from the Thames Ironworks Company, and from another large company at the east end of London. The former sent in a tender of 14*l.* 5*s.* per ton; the latter, willing to take this work at some small loss, in order to give employment to their many hands now nearly at starving point, in the present distressing season, tendered at 10*l.* 15*s.* A Belgian company undertook to deliver

the iron on the spot at 10*l.* 2s. 6d. per ton, and their tender has been accepted. There facts assuredly are not complimentary to the English workman.

To what are we to look as the cause of this? The Manchester Mechanic says the support of the Emperor of the French, the price of living, the aid of English iron and coal, and the Frenchman working six days per week, while the Englishman works little over four, are among the causes which enable the foreigner to compete with the Englishman in his manufactures. One of these causes is certainly under the control of the Englishman himself, for it stands to reason that no one can successfully rival with four days' work another with six. As regards the aid of English iron and coal, what on earth would "Mechanic" do with his coal if he did not dispose of it to foreign nations? If he only raises enough to feed English furnaces, and supply English hearths, what becomes of English colliers? They must needs work, and if the industry at present occupied in our coal mines were turned into other channels—our manufactures, for instance—the competition would as much affect the original mechanic as the rivalry of foreign competitors. Copper smelting is also a branch of industry for which "Mechanic" foresees ruin, although he says as much copper may be smelted in England now as before the Exhibition; but, owing to the practicability of smelting on the spot, mines are being worked which would otherwise never have been touched, and the supply of copper in the old markets will, therefore, be greater than the demand. But if a country finds the means of raising and working its mineral wealth, it will find some use for it other than sending it to a market already glutted. The area of manufacture has greatly extending of late years, so has the area of consumers extended in the like ratio. New countries have been thrown open to commerce. The China trade is of recent growth, also the Japan trade; the great march of improvement in India opens another channel, whilst in South America there is an immense field for commerce.

The great import of these countries is manufactured goods, the work of the mechanic. Whether the English mechanic allows himself to be superseded in the markets rests with himself. England has within herself the materials for a great manufacturing nation. Let, then, her mechanics come forward, and work in true Englishman's style, untrammelled by Trades Unions, and uninfluenced by strikes, and it will be seen that, although manufacture has become more universal, England will still hold her own proud title of the first manufacturing nation. —— OBSERVER.

THE CAUSE OF THE DEPRESSION IN TRADE.

SIR,—I have read with interest Mr. Ennor's letter, in the Journal of Dec. 14, and although he has not endorsed the sentiments of his fellow traveller, yet as it goes forth with the weight of his name it ought to be noticed. No doubt, Mr. Ennor has experienced the reaction from overdoing and excitement a dozen times, and can account for the depression on other grounds. It is well known that a little concession on the part of the men would have induced the laying down of two large vessels at the Isle of Dogs, which would have prevented the present distress; but now the work is gone elsewhere, and how much can you sympathise with men who prefer cracking stones at 6d. per day, instead of earning 6s., as they might have done.

There is no fear for old England's sons while the muscle, mind, and will are sound, but disease will produce effects. The evil of the present day is the misguidance of the masses. J. B. WILKIN.

Commercial-road, East.

THE SLATE TRADE IN NORTH WALES—No. XII.

SIR,—The manner in which a good slate property is laid open and developed will determine, in a very great degree, whether its future is to result in success or failure. It will be found utterly impossible to make a profit, even from *good* beds of slate rock, when they have to be worked under adverse circumstances. Quarry engineering is often very defective, therefore every item relating to this work should be carefully considered before any course is decided upon. How often do parties discover, after having worked years, and wasted thousands of pounds in capital, that, in order to save the property from becoming a complete failure, quite a new arrangement has to be adopted, and how many start at the wrong end, by developing a large property before they have ascertained by *proper tests* whether the kind of rock to be operated upon really possesses the elements which clearly demonstrate that favourable results may, *beyond all doubt*, be expected. Many great and valuable slate properties in the Principality are at this moment at a stand still, in consequence of the blind inconaistences practised, by assuming engineers, who (however much they may know of other matters) are quite in the dark respecting subjects connected with the effectual working of slate quarries. Is it not mysterious that such men should be consulted on matters involving these weighty consequences; and is it not, moreover, clear to every considerate mind that *effective* qualification for this work can only be *justly* claimed by the thoroughly competent and thoughtful quarryman? Can it be imagined that the numberless embarrassments so common to the working of slate rock are patent to any other than those who have long been accustomed to deal with them? The idea is as preposterous as to imagine that a person could perform a safe and direct voyage to a particular port beyond the seas without having first made himself acquainted with the rules of navigation.

As I intend this to be my last letter of this series, perhaps I should refer to *two* all-important points, in connection with the "Chambering" principle, as at present adopted in quarries worked underground. And here I may remark that, according to the rule laid down for doing this kind of work (which, by the way, is wastefully expensive, and fraught in many cases with danger and death), no proprietary can tell at what moment they may hear that wholesale fatality has been caused by the falling in of the ponderous mass which formed the roof, or overlay, of the vein of slate rock. Falls are of frequent occurrence in quarries where the roof is broken, and the joints are not far apart, and it very often happens that accidents take place, and that lives are sacrificed, during the hours of labour. If a proper principle of "roofing up" were introduced but few, if any, of these misfortunes would occur, and the workmen would not enter the different vaults under *such apprehension of danger and death* as is often the case now. I know of one circumstance in particular, where the manager (so called) threatened to discharge the men who refused to enter the chamber on a certain day, because they were suspicious that a "fall" was imminently near; some entered and came out again, and all were to have been discharged, but in less than two hours after many thousands of tons fell into the "Chamber," where, had the workmen yielded to the compulsory behest of their manager (who understood not the symptoms of danger), all must have been crushed to death. Now, the remedy which I would recommend is not only simple, but is also economical. The "chamber," from "pillar" to "pillar," is now commonly from 15 to 16 yards wide, but the system which I advocate will admit of this being made perfectly safe, with a breadth of 20 yards. Note the great saving thereby effected; one-fourth of the slate vein now left in pillars, also in the labour of "opening," and the quantity of rock thereby destroyed greatly diminished. A very few words will show the force of this argument. The width of the *actual* roof of a "chamber" must depend upon the strength of the ground above, but in *no case* should it exceed 6 yards, as experience teaches that, although the roof may be large and firm for many yards, its character changes, therefore to keep on the safe side this system must be the rule. Let us suppose that we intend making a "chamber," 20 yards wide, the roof of which is 6 yards (in the centre), in operating on the "fan" of the slate rock *each* "side hole" should incline towards the "pillar" at an angle that will leave a solid slate "bracket" 7 yards thick *across the cleavage*, from the roof of the point where the "pillar" is intersected. This principle would render the roof perfectly safe, as an arch would be formed of native material, and, although there may be occasional "joints" and "slants" in the slate "bracket," the "lap" of the "split" in the rock will (almost without exception) bind the parts partially loosened so effectually that no danger need be apprehended. Slate rock having a *vertical split* and frequent "foot joints" could not be worked safely in accordance with this description, but narrow veins, where the "foot joints" are perfect and extend across, can be mined upon the "flat roof" principle, with very little risk.

After having said so much in my letters, which you have kindly inserted in the Journal, condemnatory of many things which greatly deter the general *interests* of quarry operations, and briefly recommending remedies for many of those defects, I feel that I shall not have fully performed my duty to those who have such interest at stake (or others, who may in the future embark in this kind of enterprise) without adding a few observations in the shape of precautionary advice. In a country like North Wales, where men are to be found who have had much practical experience in quarry work, proprietors ought not to be at any loss to procure one who would undertake to visit their works, and give instructions to their local agents, at least once in two or three weeks, which arrangement would have a *reforming* effect. All slate properties that will pay for working would then be speedily known, as no person *thoroughly competent* would enter into such an arrangement, unless he was certain that he could make suitable returns for the capital invested. Among the various channels now open to investors there are none justly comparable (in point of security and profit) with the extensive resources of the slate trade in North Wales. Let all who hold good slate properties be advised to keep them, as there can be no doubt but that the future of this rapidly increasing means of commerce, which has become progressively important, will stand foremost on the trade list for producing the elements of fortune.

I hope, Mr. Editor, at some future period to find time to consider (through the columns of your Journal) the subject of "Slate Veins," "Quarry Development," and "Slate Trade Economy."

Tremadoc, Dec. 23. —— JOSEPH KELLOW.

THE LLANFAIR GREEN AND BLUE SLATE QUARRY.

SIR,—In reply to a letter in last week's Journal respecting this quarry, signed Samuel Jenkins, I have simply to remark that it is *not true* that Mr. Richards ever worked this quarry; that it is *not true* that Samuel Jenkins inspected it eight years ago, for the quarry was not opened until 1863. I cannot say that it is not true that the said Samuel Jenkins has since May, 1865, inspected *scores of mines and quarries* in England, Wales, and Scotland, but, from the reckless statements to which I have referred, I shall entertain grave doubts of his having inspected any, until I have the names of those *scores of mines and quarries*, and the facts proved by the certificates of the owners. I cannot say that *he did not* inspect the Llanfair Quarry in 1865, because we cannot prevent unauthorised and unknown individuals from getting in; but nothing is known of him there, or of his inspection.

His letter seems to have been written to advertise his "Guide to Investors." Why did you not label it accordingly, and put it into the usual corner for quack nostrums? If his "Guide" is as independent of facts as his letter, I do not wonder at your taking care the public should not be *misguided*, for you have carefully avoided letting your readers know where the "oracle" is to be found.

33, *King-street, Cheapside, Dec.* 26. THOMAS HARVEY.

LLANFAIR GREEN AND BLUE SLATE QUARRY.

WHO OUGHT TO BE BELIEVED?

SIR,—As you have kindly published of late in your valuable Journal a great deal that has been said, both favourable and unfavourable, of the Llanfair Quarry property, I would thank you to allow me to express my humble opinion on the reporters and reports in question, and also of the quarry. A single glance at the character of the reports will enable any practical man to see that only one out of the lot bears the marks which go to show that he has a knowledge of the subject. The others seem to know about as much of the matter as I know about the moon. It is most ridiculous that they should take such work in hand, and much more marvellous is it that they should be employed by any right-minded person to report on things that they cannot but be ignorant of. One seems to be a geologist; if so, his opinion might have been sought after on the surrounding country, with a view to show what native relation existed, either favourable or otherwise; on these matters he has said nothing. Next, we have a surveyor's opinion. He, too, perhaps, might have been employed to some advantage, had the company desired a true account of the extent of the tunnels made, roads laid, &c. But this does not seem to have been necessary: therefore, to earn his fee he must say something, and as the quarry (from some cause) has not yet paid, he could be at no loss to say what he did. There are, also, reports from engineers. Most certainly they, too, might have been consulted as to engineering expenditure, &c., had any been caused. But the situation of the quarry renders machinery unnecessary. Therefore, slate and slate quarrying must be made something of, in order to obtain a title as a quarry reporter. It is very clear that some of the parties referred to have been employed before on quarry inspections, but the value of their judgment on quarrying, &c., can be guessed pretty clearly. It is strange to say, too, that some sub-managers of quarries are compelled to support the views of those in higher stations, whether they are right or wrong. Most quarry reporters now-a-day may well be likened to the man who slept with a watchmaker one night, and ever after claimed a perfect knowledge of the trade. Now, for the "Guide to Quarry Investors." It is quite true that one is wanted, but the "blind guide" list is quite full, and if one may be allowed to judge (from the preface given in last week's Journal) of the one which is soon to appear, he, too, is quite up to the mark with his predecessors. But it may be that he has a quarry property for sale. It would seem that he has been travelling at railway speed, inspecting quarries, &c. (it may have been on his own account), during the last eight years. He is now, of course an authority—at least, he intends to do his best to get people to believe it; but judging from his pretended knowledge of both the Delabole and Llanfair slate rock, and his *most respectful* dissent to the opinion "that the slate rock at Llanfair is the same as at Delabole," it does not require a philosopher, a geologist, or a special commission, to prove that his shortcomings are not a few.

I have spent some years in England, working at different slate quarries, at Delabole among the rest. I always had a strong desire to learn the English language, and, having been brought up to quarry work from a boy, and hearing of there being quarries in England, I started off. Delabole was the first among the lot that I seemed to like best, but I found myself at a loss for some time, the rock being strange to me; and although I stuck to it for more than a year, I could not turn out anything like the quantity of slates that others could who were brought up in the place. I now add that I know of no rock in Wales like it, except Llanfair, and no quarryman could tell any difference in the two (it may be, the scientific "guide" can). Perhaps I should have said that about one-half of the rock taken from the Delabole quarries has a much freer split than the other half, but this is common to every quarry of any size. A QUARRYMAN.

Carnarvonshire.

P.S.—There is plenty of good rock in the Llanfair Quarry that would pay well, if parties knew how to take it out. I know that the little quarry alongside paid, whilst at work, over 12 per cent., and is now about to be worked again by a Scotch gentleman. The rock is far from being the best, but, whatever the "Guide" may say about it geologically, its facilities for working are good.

CAN THE LLANFAIR QUARRY BE MADE TO PAY?

SIR,—After all, this would seem to be the most important question. Mr. Kellow has certainly put this property at a stiff figure in respect to returns, but it should be borne in mind that 20, or even 30 per cent., is soon saved or lost in the working of a slate quarry. I think that this has been of late clearly shown in the *Mining Journal*, by a practical writer. The Llanfair is not a first-class slate property, and I consider that Mr. Kellow (who there can be no doubt is a high authority) has overrated the facilities of the quarry; still if a proper class of management and workmanship were brought into action upon this delicate rock it could not fail to make a reasonable return. It is strange that enterprising men should apply for advice on subjects relating to slate veins and quarry work to parties of the class lately enumerated in the Journal. If it takes an active quarryman from 15 to 20 years to learn the "ins and outs" of the business, how can it be possible for mining engineers, &c., to comprehend its hidden recesses by mere casual observation and theoretic computation. Again, what right has any quarry proprietor to look for good dividends, be his quarry ever so good, when he entrusts the direction of all the machinery of his establishment to vain and bonstful machinators, whose principle study, too frequently, is how they may best feather their own nest? The services of honest, hard-working, and hard-thinking quarrymen are despised, because they lack fluency of speech and bewitching audacity. My advice to the investing public is, either to appoint over their works a practical directorship, or to button up their pockets, as these are their only safeguard.

FIFTEEN YEARS A QUARRYMAN, AND
FOURTEEN YEARS A QUARRY MANAGER.

RETROSPECT OF BRITISH MINING.

SIR,—It is a remarkable thing that political economists have not called attention, except in mere passing and occasional references, to the changes in the course, localisation, and material of commerce, yet the philosophy of trade, and of the wealth of nations, would receive much light from a clear analysis and generalisation of the variations which commercial affairs have assumed. It is, therefore, the more important and appropriate at the close of a year, and the opening of a similar computation of time, to review the events which have recently taken place, either over the whole commercial field, or in any one department of its innumerable varieties. It would require a work of considerable extent to accomplish the former, but it is possible to select one branch of production for a succinct review. In directing attention to the condition of mines, mining, and commerce in metals, a selection is made of one of the most important, perhaps next to agriculture the most important, of all the sources of national prosperity. The mines of the world have laid, or have laid in them, the riches of the world, for without them agriculture, manufacture, and commerce must all become silent for ever. Mining is, if not so old as man, yet certainly as old as his wants; for scarcely had God clothed him, and changed his habitation from a paradise of rest to a working and toiling world, than the metals cropped up to his hand to sustain him in his necessities, in the maintenance of his originally civilised existence, and to aid him in his progress of science, discovery, and the arts. Where metals were found cities were founded, and civilisation shed its graces. Whenever man wandered into unknown regions, where the metals were not found, and his intercourse with metalliferous regions could with difficulty be kept up, men ceased to be civilised, and dwindled into the barbarous nomad tribes, or naked savages.

It is proposed in this letter to review the condition of mines and mining, especially in connection with tin, copper, lead, and more particularly with the mining interest of the West of England. It is important in the first place to show a comparison of prices in the years 1864, 1865, 1866, 1867, and at the same time present a general outline of the imports and exports. The measures and values as reported by the Board of Trade will enable the reader to determine for himself the rate, and the fluctuations of the prices of metals inwards and outwards. The following is a correct statement of these returns:—

Imports and Exports into Great Britain during 1864, 1865, 1866.

GOLD AND SILVER IMPORTS.

	1864.	1865.	1866.
Gold	£16,900,951	£14,485,570	£23,509,641
Silver	10,827,325	6,976,641	10,777,498
Total	£27,728,276	£21,462,211	£34,287,139
Silver ore	251,568	382,391	275,599

EXPORTS.

Gold	£13,280,311	£ 8,493,332	£12,742,059
Silver	9,877,204	6,717,662	8,928,628
Total	£23,157,515	£15,210,994	£21,670,687

COPPER IMPORTS.

	1864.	1865.	1866.
Ore Tons	67,286	82,562	94,660
Regulus	26,018	39,686	34,887
Unwght. & part wrought. Cts.	498,780	434,340	420,000
Copper ore imported, value	£893,396	£1,022,512	£1,095,360
Regulus imported, value	906,428	1,180,489	1,111,938

COPPER EXPORTS.

		Cwts.	Value.
Unwrought, in ingots, cakes, or slabs,	1864	120,211	£586,147
Ditto	ditto 1865	111,586	496,148
Ditto	ditto 1866	116,530	528,096
Wrought or partly wrought, sheets & nails, bars, rods, plates, bottoms, and pans, and mixed, or yellow metal for sheathing	1864	590,309	2,912,137
	1865	499,328	2,297,070
	1866	425,883	1,891,156
Wrought of other sorts,	1864	27,316	167,256
Ditto	ditto 1865	21,460	136,992
Ditto	ditto 1866	28,495	184,401
Brass of all sorts,	1864	42,673	234,013
Ditto	1865	44,238	232,309
Ditto	1866	41,390	227,116

TOTAL COPPER AND BRASS EXPORTED.

1864—780,509 cwts., value 3,893,553*l.*; 1865—676,412 cwts., value 3,162,519*l.*; 1866—612,298 cwts., value 2,830,769*l.*

TIN IMPORTED.

		Cwts.	Value.
Blocks, ingots, bars, or slabs,	1864	98,098	£430,650
Ditto	ditto 1865	113,972	390,750
Ditto	ditto 1866	110,462	336,258

EXPORTED.

Unwrought,	1864	89,148	£482,147
ditto	1865	103,715	498,570
ditto	1866	85,869	381,975
Plates,	1864	1,002,947	1,263,246
Ditto,	1865	1,254,367	1,481,098
Ditto,	1866	1,419,519	1,896,341

LEAD IMPORTED.

	1864.	1865.	1866.
Blocks, ingots, bars, and slabs Cwts.	98,098	113,972	110,463

EXPORTS.

		Tons.	Value.
Pig, rolled, sheet, piping, tubing, and lead shot,	1864	35,767	£779,174
Ditto	ditto 1865	27,278	581,684
Ditto	ditto 1866	30,422	670,409
Ore, lead (red and white), and litharge of lead,	1864	6,623	167,680
Ditto	ditto 1865	7,440	186,123
Ditto	ditto 1866	8,401	220,595

ZINC OR SPELTER IMPORTS.

1864 ..... 31,281 tons | 1865 ..... 30,685 tons | 1866 ..... 29,239 tons

EXPORTS.

		Cwts.	Value.
Wrought and unwrought,	1864	103,760	£112,083
Ditto	ditto 1865	89,226	94,659
Ditto	ditto 1866	109,274	130,921

IRON IMPORTS.

	1864.	1865.	1866.
Bars, unwrought Tons	53,918	51,464	64,178
Steel, unwrought	7,619	6,777	4,451

EXPORTS.

		Tons.	Value.
Pig and puddled,	1864	465,985	£1,412,352
Ditto	1865	547,641	1,599,491
Ditto	1866	497,138	1,544,647
Bars, angle, bolt, and rod,	1864	279,758	2,568,049
Ditto	ditto 1865	254,257	2,199,837
Ditto	ditto 1866	270,078	2,314,438
Railroad, of all sorts,	1864	408,215	3,305,086
Ditto	1865	434,300	3,550,563
Ditto	1866	498,595	4,166,419
Wire, except telegraphic,	1864	19,409	416,615
Ditto	1865	24,137	474,005
Ditto	1866	22,572	499,906
Castings,	1864	68,877	670,111
Ditto	1865	91,322	792,581
Ditto	1866	75,455	700,222
Hoops, sheets, and boiler-plates,	1864	123,283	1,776,652
Ditto	ditto 1865	116,052	1,603,964
Ditto	ditto 1866	135,189	1,779,177
Wrought of all sorts,	1864	107,108	2,257,406
Ditto	ditto 1865	122,982	2,456,202
Ditto	ditto 1866	132,473	2,678,535
Old, for re-manufacture,	1864	3,494	13,818
Ditto	ditto 1865	2,961	12,587
Ditto	ditto 1866	15,845	66,264
STEEL, unwrought,	1864	26,834	890,395
Ditto	1865	23,877	782,129
Ditto	1866	34,647	1,129,761

TOTAL OF IRON AND UNWROUGHT STEEL.

1864—1,502,964 tons, value 13,310,484*l.* | 1865—1,617,509 tons, value 13,471,369*l.* 1866, 1,681,992 tons, value 14,829,369*l.*

The decline in the demand for British mineral produce has gone on for the last decade with appalling steadiness and certainty. Let this be illustrated by the produce of copper ore and copper for 1857. In that year the value of copper ore was a little over 1,500,000*l.* sterling, in 1866 it was barely half that amount. The value of copper in 1857 was a little short of 2,250,000*l.* sterling, in 1866 it was considerably under half that amount. This is not merely an unfavourable comparison between two years, neither of which was prosperous, for every year since 1857 there has been a regular diminution in the value of both ore and copper. In a few instances in this gradual descent quantities increased, but, nevertheless, the total values exhibited a decline. The trade in copper actually transacted does not indicate an equivalent in British production, as the statistics of 1866 establish. In that year there was exported from England 30,615 tons of copper, of which little more than one-third—11,153 tons—were British produce. Thus, exclusive of the British and foreign copper

used for home consumption, England sends abroad little more than a third British of her whole copper exports.

The great falling off in the demand for our copper has been caused by a variety of circumstances. The development of foreign mines of great richness and facility of access has been the chief cause. Discoveries in Australia, North and South America, North and South Africa, &c., have led to a competition in the English market with our own produce, before which the latter has receded.

There are various uses to which copper was put heretofore in which other metals are now employed. Copper was necessary as sheathing for wooden ships, which are now displaced by iron and steel. Formerly copper entered into the composition of the brass and bronze ordnances of our navy and army, but iron and steel are now all but exclusively used for such purposes.

For steam-engines, and the metal employed in pumps in mines, copper supplied material years ago, but it is nearly all displaced by iron and steel. Babbage's metal has been substituted for brass in a great variety of things, from optical and surgical instruments to shop front ornaments.

Tin has suffered as heavily as copper in the progressive decline of late years. Banca and Straits tin has (to use a common illustration) inundated the market. The deep mines of our British Peninsula cannot yield tin as cheaply as the surface mines and cheap labour of the Great Eastern Archipelago. Apart from the disadvantages as to the price of labour, and the depth of the veins which Cornwall and Devon supply in the above comparison, there is also the burden laid upon mining capital in the shape of heavy royalties, and the enormous price charged for the destruction of surface land.

Mining property has also suffered in England from mining market illusions. "Bulling" and "bearing," rigging the market, gambling, and trading in mere shares, are no more a part of mining operations than insurances in Lloyds, or the importation of guano. These share-broking escapades have certainly an influence upon mining, which is always pernicious, often disastrous. When men buy shares which bear a fictitious value in the result of Stock Exchange manœuvres, and, as a matter of course, speedily lose their money, they raise an outcry against mines and mining, when their own folly, and the tricks of persons who live by that sort of thing, are alone to blame. Men might as well cry out against the breeding or fattening of cattle because they lost money by shares in a cattle market, which was imposingly put before investors, but proved to be an imprudent or dishonest speculation.

This is the proper place to notice the influence of "Limited Liability" upon the recent past and the present of mining. That limited liability companies formed for mining purposes have proved merely speculative, or abortive, is no more an argument against mining than it would be an argument against banking or shipbuilding, that in these departments rash and ruinous enterprises have been entered upon. A comparison of the Limited Liability Principle with that of the cost-book, as applied to mines in Cornwall and Devon, will show the superiority of the former. By examining the proceedings of the Stannaries Court for the winding-up of companies, it appears that there are 19 under the limited liability and about 80 which were constituted under the Cost-book System. This is at once a simple and sufficient refutation of the advocacy of the Cost-book System to the disadvantage of limited liability. It is evident that whatever influence the latter may have had in causing the ultimate winding-up of companies, the former has had at least four times as much.

The present condition of Cornish and Devon mining is a consideration of importance and anxiety. Besides the large number in the Stannaries Court, there have been within the last few years above 150 which have ceased to work. This is a melancholy picture of a once prosperous, happy, and industrious neighbourhood. Conceive of 250 families thrown upon mendicity, the fact would move even a callous heart; but how shall we compute the magnitude of the disaster when 250 centres of labour, supporting each many, many families, become scenes of silence, desolation, and ruin. This is a mournful aspect of a great industry, the sadness of which is intensified by the fact that no industry is more profitable to the population in rural districts, the lords of the soil, or the investors of capital. In 1864 there were 37 dividend-paying mines, a few only of which were not in the West of England. These, upon an outlay of 1,043,737*l.* 4s. 2d., have yielded profits to the extent of over 4,500,000*l.* sterling, independent of the market value of shares, and those mines continue to pay to this day. In 1865 three additional mines became profitable, and, on an outlay of less than 54,000*l.*, made dividends to the extent of over 300,000*l.*, irrespective of the market value. In 1866 three other mines became paying concerns.

There are many mines abandoned in Cornwall which have yielded vast profits when inadequately worked. The re-working of these with sufficient capital, and the improved machinery of the present day, offers to enterprising men a fine opportunity of doing good to themselves and to their country. There are, besides, scores of new explorations, upon which only a few fathoms have been sunk, but which offer reasonable evidence of metalliferous wealth. The improvements in mining science and mechanics offer not only the hope, but the assurance, that future operations will be of a lasting kind. Shafts will be so sunk, and levels so driven, that if the workings be abandoned by a company or an individual unable to proceed with them the work performed can be taken up by the successors to the property, and carried out with comparatively little cost to a successful result. The year 1867 has been in the country, as in the metropolis, one of timidity among investors, of dull trade, and disheartened traders. No part of the country has suffered more than Cornwall. Her moral and laborious people have migrated to the Midland and Northern Counties, or emigrated to Australia or the United States. There exist, after all, the elements of a great and enriching industry in Devon and Cornwall; and when confidence revives, and trade finds its proper tracks again to move in, Cornwall and Devon will, we trust, take up the impulse early and eagerly, and once more stand prominent for work and wealth amidst the counties of England.

Gresham House, Old Broad-street, Dec. 24. THOMAS SPARGO.

MINING—PAST AND PRESENT.

SIR,—The year 1867 has well nigh passed out of time. During the early part of this year, and that of the past, one of the greatest calamities befel the mining industry of this country on record, as far as regards the tin and copper mines in Devon and Cornwall. Owing to a combination of circumstances, tin fell from 90*l.* per ton of black tin, or tin ore, to about 44*l.* ton, and copper from a standard of about 148*l.* to 95*l.* This depression caused the suspension of a number of mines, and a vast loss of property to the adventurers. Consequently much distress has since existed amongst the labouring population. A very serious lesson to the labourers to let well alone. In the month of January, 1866, a great stir was made by them in some of the populous districts in Devon and Cornwall to get higher wages, owing to the bad advice of some itinerant lecturers visiting these districts, and sowing sedition as they travelled the country. These strikes caused the stoppage of many promising young mines; and mines, like every other undertaking, require time to bring them into profitable results. We must hope that the year about to commence will usher in new rays of light, and that the sun will again shine on the great hives of mining industry. With tin at 50*l.* per ton, very few of our deep mines can do more than pay working charges and open out fresh or new discoveries; and, in the absence of such, several old mines cannot continue profitable for many years. But things wear a brighter aspect. Both tin and copper of late have been advancing, and the stocks gradually decreasing. Copper at 120*l.* standard, and tin at 65*l.* per ton (ore), is high enough for the well-being and prosperity of this country. Put a trig to the wheel at these quotations, and this country has nothing to fear. A MINER.

Dec. 26.

A CAUTION TO MINING CAPTAINS.

SIR,—Allow me to offer a few remarks, through the medium of your valuable Journal, upon a subject which has created a strong feeling in this district. There is a mine in this immediate neighbourhood which, according to information received through your columns, is paying from 150 to 200 per cent. per annum at the present time. This mine was commenced a few years ago, by a company consisting principally of Liverpool gentlemen. A captain was engaged, but, unfortunately for himself, he was not a man of education, but I will venture to say he was one of the best miners in this district, which, as an adventurer, I should consider a much more desirable qualification than the former. There was great difficulty in working this mine, as it had been extensively wrought by previous companies; but, by dint of great perseverance, forethought, and skill, he so opened the mine that he succeeded in interseting a fine run of ore, which has been returning for some time between 20 and 30 tons per month. This he did in the face of the opinions of many good miners in the locality, who said the mine had been worked out; therefore, I feel sure your readers will agree with me there is every credit due to a man who, in spite of these conflicting opinions, finds lead which is paying the shareholders such handsome profits, and one would think that the shareholders themselves would be only too proud to possess such a valuable servant, but such, I am sorry to say, is not the case. After having opened out the mine, they in the most unworthy manner turn round upon the man and dismiss him, without assigning any other reason than that he is not scholar enough for them. (Query, do these Liverpool gentlemen want a graduate from either Cambridge or Oxford?) Surely this treatment is enough to make any man lose all confidence in companies. I am glad to say, however, that most companies are not like these Liverpool gentlemen, or mining would look darker in the district than it now does, and that is unnecessary. L. M.

Mold, Dec. 26.

THE DUCK'S FOOT PROPELLER.

SIR,—The invention of Mr. Colin for propelling boats, referred to in last week's Journal, is not new. In the year 1847 I and a carpenter, named William Lawton (who originated the idea), then employed at the Neston Colliery, where I was, had a punt for following wild-fowl, to which this scheme [Mr. Cottingham sends a sketch representing an arrangement identical with Mr. Colin's] was applied, and it worked well, being noiseless; the objection applying to oars or paddles being the splashing noise they made, which scared the birds. The leaves were so hinged on the arms that they closed on the return stroke, and were prevented from opening too wide by cords across: they are worked by a lever in the boat.

Mold, Dec. 24. T. L. COTTINGHAM.

PROF. SMYTH'S LECTURES ON MINING.

SIR,—The arrival of the *Mining Journal* is most ardently looked for in this part of Sweden, particularly now, as it contains the very instructive lectures of Mr. Smyth. I consider every miner should highly appreciate them, and it is with peculiar pleasure that I have read them. Admitting that we are acquainted with mining in our own country, every miner has not travelled in various parts of the world, where so many different kinds of minerals are to be seen.

By your permission, I will give your readers a few particulars of the lodes or ledges of California, as it may interest those of them who have not been in that highly-favoured mining country. The Fremont estate, in Mariposa county, contains upwards of twenty lodes; the principal one is called the Mother of Quartz Lodes, being in places upwards of 60 feet wide; extensive operations have been carried on for several years on the north boundary; the Merced river runs where two large water-wheels lift eighty-four stamps heads, and reduce nearly 100 tons per day of the ore. As stated above, the lode is large, and bears nearly north-west; its angle of inclination is east; a number of other lodes or branches are found east and west of the main lode, which are, no doubt, shoots of the parent vein; the principal operations on the lode have been carried on at the Pine Tree and Josephine Mines; the ground is admirably situated for draining and discharging the ore; levels have been taken up on the lode from 300 to 400 ft. in depth. I may remark that the mines are over 1200 ft. above the level of the Merced river. Although the lode is so large, it must not be supposed that all the rock is payable: generally the footwall or west side is the richest, particularly what miners call the casing on the footwall; this I have often found to be rich. To enable the uninitiated to understand it, I may say it often occurs that small strings of quartz are found embedded in the strata, in talcose rock or granite, as the case may be; such has often come under my notice, particularly in the former mine. Although the Josephine vein is apparently a split or part of the main lode or vein, it apparently belongs to a later geological period, as is evinced by the character of their relative ores. Both rocks are of flinty hardness, and white, with here and there streaks of dark grey, nearly black from the deposit of sulphurets.

The Pine Tree quartz presents its metals mostly in an oxidised state, the iron looking rusty or red, the copper as red oxide and blue and green carbonates, which gives a variegated and fantastical appearance to the rock, much of which is truly beautiful: instances of perfect crystallisation have been but rarely known, although now and then imperfect formations, through which are traced fine lines of gold and copper, have been met with. The Josephine rock, unlike the Pine Tree, presents the sulphurets in their original metallic lustre; in fact, this and the Princeton vein contain the most of their metal in the form of sulphurets.

The lode can be traced a great distance, as stated, above the Merced river, and forms the northern boundary of the estate: at this point the lode is split into innumerable strings by a band of greenstone; after several disruptions, these smaller veins appear to unite into a compact lead, and even as far as Pena Blanca, which point is twenty miles from the river, their outcroppings form the marked crest of that locality, where a wall of quartz projects several feet above the ground, following the course of the lode as far as Coulterville; it can be distinctly traced, and at different points has been worked on extensively; in Mariposa county alone it can be seen for nearly thirty miles.

The granite runs in a north-east direction, and on a clear day the great falls of the "Yosemite," towering over 200 feet above the valley (the walls of which are granite), although forty miles distant, can be plainly seen from Mount Bullion, on the Fremont estate.

Norrtelja, Sweden, Dec. 17. W. HOSKIN.

THE CLIMATE OF NICARAGUA.

SIR,—It seems to me that some undue importance has been attached to certain remarks on the climate of Nicaragua made by Sir Edward Belcher at a recent meeting of the Royal Geographical Society. These remarks were to the effect that the climate of Nicaragua was very bad; in fact, the vilest of the whole American continent. Allow me to remind you that the gallant admiral favoured our society with the substance of these remarks some years ago on the discussion of Capt. Pim's paper "On Nicaragua," and that they were then, as now, shown to be erroneous; and what is more, they are a flat contradiction of statements made by himself in his "Voyage of H.M. Ship Sulphur," published under the authority of the Lords Commissioners of the Admiralty. Sir Edward Belcher must be aware that his remarks would to some extent, limited though it may be, depress the value of extensive properties held by British capitalists in Nicaragua, and that it is, therefore, all the more unpardonable to venture upon reiterating statements so reckless and erroneous. Sir Edward Belcher tried to pass himself off as an authority on the climate of the *whole* of Nicaragua, but it should be borne in mind that the greater part of that country is a sealed book to him. New Segoria and Matagalpa are as healthy departments as can possibly be found within the tropics, where you may travel for days in pine and oak forests, and are neither troubled by heat, fever, or insects; and in the mountains of Chontales, of which the speaker was equally ignorant, one is very glad to sleep, even during the warm season, under blankets. Indeed, all that Sir E. Belcher knows about the subject of climate, from personal experience, is derived from a short trip which he made on the West Coast, to the towns of Leon, Managua, and Tipitapa, and which took him a fortnight, but which I performed in two days. For the completion of his knowledge he must necessarily consult the writings of those who have explored and lived in districts of the country in which he himself has never set foot. He may call the climate of the limited portion of Nicaragua known to him "vile," but I do not think that he will find many to agree with him. Moreover, in his own book, alluded to above, he tells us that when he arrived in Nicaragua he had "suffered much" (Vol. I., p. 160), but after travelling a fortnight in this "vile climate" he is compelled to own "I certainly felt my constitution considerably refreshed" (p. 178). Not bad this for the vilest part of the American continent! Better still; on the morning of Feb. 10, 1838, the invalid traveller found himself in a temperature of only 66° (p. 162). A couple of days later "it was cold enough for 50° N (p. 169); and he then commenced his journey to Managua, a town "which is generally considered peculiarly healthy, the average deaths seldom exceeding 1 per cent." (p. 172). To make double sure of the "vileness" of the climate, he quotes in the appendix of his second volume (p. 303) the official report of the British vice-consul in Nicaragua, in which the following passages occur:—"The climate is considered generally very healthy. . . . . The health of the natives, as well as the Europeans, is influenced by the change of the season. Any important deviation may be traced to neglect or excess, particularly as regards foreigners."

A FELLOW OF THE ROYAL GEOGRAPHICAL SOCIETY.

Dec. 23.

CHONTALES GOLD AND SILVER MINING COMPANY.

SIR,—I had hoped that the merciless exposure made in a letter signed "A Chontales Shareholder," with reference to a circular, purporting to be signed by "A Stock and Sharebroker," but which, as your correspondent has shown, bears a name which does *not* appear among the list of stock and sharebrokers, nor does it appear at the address given—would have proved sufficient to prevent the repetition of such transparent balderdash. It is strange that there are still a certain class of people to be found who, confiding in their own imaginary power, believe that shareholders can be led away by the proffered and gratuitous opinion of anyone who is obviously less familiar with their property than themselves. Past experience has taught shareholders to put to themselves the natural enquiry—Why should Mr. ——, of —— street (who is a perfect stranger to me) put himself to the trouble and expense of printing a circular, and, having obtained my address, of forwarding a copy (paying postage, of course), with the avowed object of doing something for my especial benefit? All I can say is, my knowledge of the world leads me to the conclusion that such abstract kindness is a rare jewel; but the truth is that Mr. ——, of —— street, as common-sense people, of course, know full well, has a greater interest in his own pecuniary welfare than he has in mine; and that when he "confidentially" urges me to dispose of my interest in this property, it is to enable him—or, rather, other parties for whom he is the scapegoat—to purchase previously-sold, but non-existing shares at as low a price as possible, and so pocket the difference, which can only be done at the expense of some unwary shareholder, who, perchance, may be misled by a "stock and sharebroker's" *advice*.

AN "UN"-DECLARED MEMBER OF THE STOCK EXCHANGE.

GREAT NORTH LAXEY, AND ITS MANAGEMENT.

SIR,—As I fully expected, Capt. Rowe, in a letter dated the 17th inst., addressed to Mr. J. H. Murchison, and published in the Journal of Saturday the 21st inst., has thought it necessary, amongst other things, to caution the directors and shareholders not to believe the statements "published, respecting this mine by some who do not append their names to their published letters." Now, this is what may, without exaggeration, be termed cool, intolerable presumption. Caution the directors, forsooth: may I very humbly ask Capt. Rowe who or what are directors? Are they the employers or the employed? By this caution, I think it is very reasonable to infer that he looks upon them as the employed, and he as their superior, by whose directions they must speak and act. The, unfortunate shareholders may be in a position to receive such a caution, but emanating from such a source, how many on this island will place any reliance upon it? It has come too late. It should have been given long ago, and if of any value the shares would not now be offering at the unprecedented low prices quoted in the Journal. So much for Capt. Rowe's caution. Now, will you permit me to give the English directors a few words of caution? you see I am addressing the English directors only for obvious reasons. The charge of presumption may be attributed to me, who am only a shareholder, for doing so; nevertheless, they may take it for what it is worth. It is this: unless periodical and personal inspection of the workings throughout the mine be made by them, they are not worthy the trust reposed in them or the position they occupy. It is their duty, and if they do not make an effort to perform it, or if they continue to act as they have hitherto done, they need never hope to have the gratifying intelligence to impart to the shareholders in the present company that a dividend may be looked for, or that the prospects are so encouraging as to convey a hope that the shares may become enhanced in value, or that anything but bankruptcy awaits the concern: my caution is now ended.

And as I have more to do with facts than with cautions, permit me to observe, in the first place, that I admit Capt. Rowe, with the aid of his "clerical pseudo mining assistant" (who is well known here), can get up a most colourable, and apparently reliable, production, in support of any statements he may publish touching the works over which he has evidently sole control, and if taken to task for inaccuracies, will repeat his assertions with abusive epithets and slanderous inuendoes, by which he thinks to write down any person who may dare to publish any statement differing from him. Notwithstanding such, I repeat that "the stopes in the sole of the 84 north, on Dec. 2, were worth at least 4 tons to the fathom." This assertion, unsupported, is equally as reliable as Captain Rowe's, and until he gives some proof to the contrary very few shareholders in this island will be disposed to place any belief whatever in his statement. I did think that he would not have had the audacity to reiterate his report, but I am on that point deceived, and I must now endeavour to convince him and his clerical colleague of the error of their ways. In the letter referred to Capt. Rowe asserts that he valued the stopes "below the end, driving north, in the 84, at 1 ton to the fathom." It must be understood that on the 2d inst. the stopes spoken of were several fathoms from the end. By his report, which is very ambiguous, whether meant or not, many persons would be led to infer that the stopes were immediately under the end. Such was not the case; but is of little consequence, as I have at present to do only with the stopes in the sole of the 84 on the 2d inst. In proof of what I stated, I, laying aside the opinion, which was a correct one, expressed in my letter to you Dec. 10, reluctantly referred to some immediately under the control of Capt. Rowe, and I now refer to the miners working in the stopes, who, when asked what they considered to be the value of the stopes, estimated them at 4½ tons to the fathom; and I venture to say, further, that the foreman at the mines, or the miners named, will not make oath that the stopes were worth less than I represented. If further evidence is required, I can give the name (though not authorised to do so) of a large shareholder, who informed me that on the 7th inst., when in conversation with Capt. Rowe, and in reply to a question put to him as to whether the stopes in the 84 were worth the quantity currently reported—4 tons to the fathom—he admitted they were, but that they were not available. Again, on the 2d inst., there were not above 23 tons of ore at surface, dressed and undressed, and the only portion of the mine, independent of the 84, producing ore worth naming was the stopes in the roof of the 60, going south, which would, at most, produce 1 ton to the fathom.

Capt. Rowe informs the directors and shareholders that "we sampled to-day 40 tons of lead, for sale on the 30th inst." Where did the ore come from within a period of 15 days, Sundays included, to make up the quantity from 23 tons to 40 tons? I was informed at the mines that it was intended to sample only 30 tons for sale this month. How comes it that this resolution became so quickly altered? I surmise that my letter alarmed Capt. Rowe. The lead was broken underground, and, in case of inspection, it would have been found to have been taken out of the sole of the 84, as no other place could produce it. He further says that "during the last month 12 fms. of ground were stoped for ore, of which 4 fms. 4 ft. were in the sole of the 84, and our total raisings throughout the mine for the month were 10 tons." Does Capt. Rowe, for one moment, really think that he can persuade any person who will take the trouble to look at his reports previous to the report of the 6th inst. to believe that the stopes referred to produced only 1 ton of lead per fathom for the whole of the 4 fms. 4 ft. stoped? Why, 'tis absurd. I ask, again, where did the 17 tons of ore come from to make up the quantity from 23 to 40 tons within 13 working days? I say it came out of the 84, and nowhere else. I do not wish to anything personally offensive to Capt. Rowe or his clerical assistant, but, as one having bought into the mine when the shares were at a considerable premium, I consider that I have a right to express my sentiments touching the management, which I believe to be bad, and which I consider has been the cause of the reduction of the shares to the prices quoted in the Journal. I do not want Capt. Rowe to say that a course of ore is of greater value than it really is, but I wish to have a true report, and if the shareholders would only take the trouble to go and see for themselves, they would be but of one opinion, and that is, that the mine is not fairly reported by him. If Capt. Rowe is anxious to obtain the name of the writer of this and the former letter, he can have it by applying to the Editor of the *Mining Journal*. The caution of Capt. Rowe may have been necessary to screen him from detection. But let the English directors come and inspect the mine for themselves, and they will find a very different state of things to that represented by Capt. Rowe; they will find a better course of ore in the sole of the 84 than ever was met with in the mine since it started; in fact, much better than when the shares were selling at nearly 3*l.* per share. And the shareholders will very soon experience the fact that instead of an apparently worthless mine they have a property, with judicious management, self-sustaining, if not capable of paying dividends. In conclusion, I say to the shareholders, go and examine the property for yourselves.—*Douglas, Isle of Man, Dec.* 24. A SHAREHOLDER.

THE ITALIAN CONSOLIDATED MINING COMPANY

(LIMITED).

Incorporated under the Companies Act, 1862.

CAPITAL £50,000, IN 25,000 SHARES OF £2 EACH

(WITH POWER TO INCREASE).

5s. payable on application, 5s. on allotment. Future calls not to exceed 5s. per share, at intervals of not less than six months.

CHAIRMAN—JONAH SMITH WELLS, Esq., Holland Park.

SOLICITORS—Messrs. CURTIS and BEDFORD, Haberdashers' Hall, E.C.

BANKERS—Messrs. BARCLAY, BEVAN, TRITTON, TWELLS, and Co.

BROKERS—Messrs. FOOTE and ADAMS, 75, Old Broad-street, E.C.

OFFICES,—No. 9a, GREAT ST. HELEN'S, E.C.

ABRIDGMENT OF PROSPECTUS.

This company is formed for the acquisition and working of mineral properties in Italy.

It is intended that the acquisition of such properties as may be selected from time to time shall be made, as far as possible, by the issue of the company's debentures, so that the share capital will be applicable to the development of the mines, and will not be absorbed by immediate cash payments for the purchase of the same, as so often happens in similar enterprises.

Arrangements have been made for the acquisition of two Government setts adjoining the rich and successful gold mines of Pestarena.

The Pestarena lodes have yielded almost from the surface great treasures in gold, and their direction is such that they will traverse the above setts. Early and profitable gold returns may, therefore, be expected from them—indeed, rich auriferous ore has already been discovered in one of them.

Auriferous lodes have also been discovered in another sett secured by the directors, and situate in the Val Bianca.

Arrangements have also been made for the acquisition of two valuable copper mines in the district of Pallanza, with the whole of their extensive plant, and also the leasehold interest, with the right of purchasing the freehold, of a silver and lead mine in Lombardy. The ore now being obtained from the deepest point of this last-mentioned mine is rich in silver.

Prospectuses and forms of application may be obtained of the brokers, Messrs. FOOTE and ADAMS, 75, Old Broad-street, and at the company's offices.

All deposits will be returned in full unless 15,000 shares at the least are applied for.

Ten thousand shares have been already subscribed for by shareholders in the Pestarena Gold Mining Company (Limited).

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Mining Correspondence.

BRITISH MINES.

BLACK CRAIG CONSOLS.—J. Smitham, Dec. 25: We put 35 tons 7 cwts. of lead (dry weight) in the railway trucks yesterday, and we are looking well for another parcel of lead soon, or in less time than we got the last. Upon the whole, our stopes never looked so well for lead as they do to-day. The stopes in the back of the 54 fm. level, west of Harriett's cross-cut, will produce fully 30 cwts. of lead per fathom for the whole length of stope, between 10 and 11 fms. for (say) 6 ft. wide, but in places our stopes are 18 ft. wide. We are driving a splendid pile of lead from the stopes to-day. The stope in the back of the 54, east of No. 2 cross-cut, is continuing to improve, and is now producing fully 12 cwts. of lead per fathom.

— John Smitham, Dec. 26: The change of ground we got last week in the south-east corner of the shaft, below the 54 fm. level, is coming out of the shaft as fast as we get down, and last night we had a hole in the south-east corner, which produced two kibbles of very good stuff for lead, and has a promising appearance for a further improvement. I like the appearance of the ground for lead. We have not seen the south wall of this lode below the 33 fm. level, and it is my impression the stones of lead we have been getting in the shaft, sinking from 33 to 43 and from 43 to 55 fm. level, is from a bank of lead to the south, which must be proved by cross-cuts, and the south wall of the lode funnel. The shaft is 10 fms. to the south of the north lode, where we are getting our returns from. We are driving a good pile of lead again to-day.

BOTTLE HILL.—J. Eddy, Dec. 26: There is nothing new to report on this week. The main and south lodes are about the same as to size and quality as when last reported. The samples are sent to the different smelters, the quantity being about 4¼ tons. I hope to go to the smelting-house to see the weight of the parcel on Saturday or Monday next.

BRONFLOYD UNITED.—T. Kemp, Dec. 26: The lode west of cross-cut, in the 63, is worth about 35 cwts., and east of cross-cut fully 20 cwts. of lead ore per cubic fathom. The stope under the 52 is worth 30 cwts. of ore per cubic fathom; and the stopes to the east and west of winze, in back of the 52, are worth on an average 15 cwts. of ore per cubic fathom. We cut a fine branch of solid lead, from 3 to 4 in. wide, running across the end of the 40 west; I have put the men to cross-cut south, for the purpose of proving the lode in that direction. In my opinion this western ground is presenting indications from which we may calculate upon meeting with most successful results. The machinery throughout the mine is in first rate trim.

CAPE CORNWALL.—R. Pryor, F. Hosking, Dec. 26: The lode in the 70 fm. level, driving west of engine-shaft, is principally composed of mundic, with a little copper ore intermixed—a kindly lode. All other places without much change.

CALDBECK FELLS.—W. Francis, Dec. 20: The lode in the 90 west, on the north lode, has improved since my last report, and is now worth 6 cwts. of blue lead per fathom; driving by six men, at 10l. per fathom. We are sinking on the course of the caunter lode below the 90 west; the lode at present is worth 12 cwts. of blue lead per fathom; sinking by six men, at 15l. per fathom. Dobson's stope, in the back of the 90 west, on the caunter lode, is worth 16 cwts. of blue lead per fathom; stoping by four men, at 4l. per fathom. Craze's stope, in back of the same level, is worth 1 ton 5 cwts. of blue lead per fathom; stoping by four men, at 3l. 15s. per fathom. Hodgson's stope, in back of the 80 west, on caunter lode, is worth 8 cwts. of blue lead per fathom; stoping by four men, at 4l. per fathom. Moffat's stope, in back of same level, is worth 12 cwts. of blue lead per fathom; stoping by six men, at 3l. 15s. per fathom. Lamb's stope, in back of the 80 east, on south lode, is worth 9 cwts. of grey lead per fathom. Wilkinson's stope, in back of the 70 west, on north lode, is worth 10 cwts. of blue lead per fathom; stoping by four men, at 5l. 15s. per fathom. The ground in the 60 west continues much of the same character as when last reported; driving by six men, at 5l. 10s. per fathom. In Robinson's rise, in the back of the 60 west, our progress is slow, owing to the hard nature of the ground; rising by four men, at 8l. per fathom. The lode in the 30 west is worth 7 cwts. of blue lead per fathom; driving by four men, at 6l. 10s. per fathom. In the cross-cut driving south from the 30 west the ground is hard for progress; driving by four men, at 8l. 10s. per fathom. Asbridge's stope, in the back of the 30 west, is worth 18 cwts. of blue and grey lead per fathom; stoping by six men, at 3l. 15s. per fathom. Hewer's stope, in the back of the same level, is worth 10 cwts. of blue and grey lead per fathom. Nicholson's stope, in the back of the same level, in the middle string, is worth 12 cwts. of grey lead per fathom. The lode in the intermediate level east, at Mexico, continues unproductive; driving by four men, at 3l. 17s. 6d. per fathom. The rise in the back of the same level is also poor; rising by two men, at 2l. 10s. per fathom. We are clearing the ground on the top of the hill preparatory to sinking the new air-shaft in the west part of the sett. We have to-day sampled from 36 to 40 tons of grey lead ore, and last week we sent to Messrs. Bibby, Sons, and Co. about 15 tons of good quality copper ore. The late hard frost has retarded our dressing operations.

CARDIGANSHIRE LEAD.—E. Pease, Dec. 21: Glan Rheidol Mine: The lode in the 40, west of the engine-shaft, has improved since my last report, and, from present appearances, is likely to open out a good length of profitable ground. The lode in rise in back of the 40, against No. 2 winze, is worth 1 ton of lead ore per fm. We have about 2¼ fms. more to communicate with said winze, which I hope will be holed in three weeks from this time. The lode in the stope in back of the 40 is not looking so well as it was, worth 15 cwts. of lead ore per fathom, and looks promising for an improvement. In the 40 fm. level cross-cut, south of the engine-shaft, we have driven through some small branches of late, and I expected we were near the lode, but up to the present time it is not intersected; the ground is highly mineralised. There has not been much done in sinking No. 2 winze, as the late rains completely overpowered us with water. We intend trying again on Monday next, but I fear we shall not be able to resume the sinking. The stope in the back of the 30 west will yield 16 cwts. of lead ore per fm., and improving; this is whole ground to surface, and I have no doubt will yield a fair quantity of minerals. The lode in the 30 west is producing a little lead ore and blende, but not enough to value.

CHIVERTON.—J. Juleff, J. Borlase, Dec. 26: At Cookney's shaft, sinking below the 120, the lode is large, with stones of lead. In the 120 west the lode is 4 ft. wide, with stones of lead. The east end is unproductive. The 110 east is worth 8 cwts. of lead per fm. The west end is 2 ft. wide, presenting a promising appearance. In the 100, east of Murray's shaft, the lode is 2 ft. wide, producing stones of lead. In the 76, east of old engine-shaft, the lode is 3 ft. wide, composed of quartz and brown carbonate of iron. No lode or branch seen in the 76 cross-cut, north of old engine-shaft, since our last report.

CUDDRA.—F. Puckey, December 24: In the 142 fathom level, driving west of Walker's shaft, we are still driving in the killas, by the side of the lode, which is favourable for progress. In the early part of next week we shall commence to cross-cut the lode at that level to prove its value. The ground in the 130 end, driving west of the same shaft, by the side of the lode, is somewhat improved, and we hope for the future to make greater progress in driving this end to get under the bunch of tin that is gone down below the 100 fm. level. In the stope in the back of the 130, east of winze, the lode is 10 ft. wide, composed of quartz, peach, iron, and tin, and worth for the latter 16l. per fathom for that width. In the stope in the back of the same level, west of the winze, the lode is 9 feet wide, and worth 12l. per fathom. The lode in the stope further west is 8 feet wide, worth 10l. per fathom. In the stope in the back of the 100 fm. level, west of Walker's shaft, the lode and branches are 15 feet wide, containing pretty much white iron, and worth for tin 16l. per fathom for that width.

DALE.—R. Ninese, Dec. 23: I regret to say that the water began to rise again on Saturday from the rain and thaw, and is only beginning to lower a little.

— R. Ninese, Dec. 26: The weather being more favourable just now the water is sinking faster, and at the rate it is now going down I hope to have it out at the end of the week.

DRAKE WALLS.—Thomas Gregory, Dec. 24: The branches in the 50, east of south cross-cut, continue to improve, and are worth 15l. per fathom. In the 30 fm. level cross-cut south the branches are worth 12l. per fathom for the part being carried. We shall shortly commence a winze in this level, in order to communicate with the stopes in back of the 50 east. The south branches in the adit level east, and west of south cross-cut, are worth 12l. per fathom. There is no change to notice in the stopes since last report. At surface we have completed and set to work 24 heads of steam-stamps; the other 24 heads are in a forward state. The whole of them would have been at work long before this had it not been for some delay in the delivery of the castings. In a short time we shall be in full work, and the samplings will increase.

EAST CHIVERTON.—R. Southey, Dec. 24: We have re-set the 25 fm. level main cross-cut, from Bartlett's shaft, to drive north, by four men, at 30s. per fathom; ground still continues favourable for driving, and in the same kindly stratum as reported on last week. The end west to drive on the course of No. 1 lode, by six men, for the month, at 45s. per fathom. In the last 6 ft. driven the lode has improved in size, now about 1 ft. wide, and carrying more gossan and flookan; the ground about the lode is impregnated with mundic throughout for the full width of the end.

EAST PROVIDENCE.—J. Nancarrow, Wm. White, Dec. 20: The ground in Boorman's shaft, below the 106, is of just the same character has it has been for the last two ore three levels. The men are now in full course of sinking. The lode in the 106 east and west is small. In the 94 east we have commenced cross-cutting north to the Carbona—ground favourable. The 82, in driving east from the cross-cut, is communicated with the Carbona winze, and the end is continued eastward, where the lode is worth 14l. per fathom. This ground will now be worked to much greater advantage. There has been no lode broken in the 50 since last report; it is, therefore, worth 5l. per fathom. The tribute pitches are just as they were at the setting. Owing to the draining of the surface by the driving of the shallow level, we have no increase of water in the mine up to the present.

EAST SNAEFELL.—W. H. Rowe, Dec. 24: Till yesterday we have been driving through a fine-looking lode in the 15 fm. level, which is yielding good saving stuff. The end just now happens to be a knot of close ground, which I do not think will continue many feet. Having now secured with strong timber the side where the lode entered the shaft, we shall resume sinking with all possible speed. At surface we are getting on well with the dressing-floor, and protecting it from floods; we started to grate the stuff to-day. In addition to the large heap to begin with, the whole of the stuff from the shaft will now pass through the grate.

EAST WHEAL GRENVILLE.—G. R. Odgers, W. Bennetts, Dec. 21; The lode in the 110 fm. level, west from the engine-shaft, is 2¼ ft. wide, and worth 1½ ton of copper ore, which is very wet, and partaking of all the characteristics of being on the eve of a bunch of ore. All the other places are looking precisely the same as we stated on Wednesday.

EAST WHEAL SETON.—Joseph Vivian and Son, William Thomas, jun., Dec. 24: We are making good progress in sinking the engine-shaft, which is now about 7½ fms. below the adit, and will reach the lode at about 20 fms. below the said level. Thus far we are able to sink without working the engine, although the water is increasing. We have been obliged to suspend driving the 10, east of eastern shaft, on account of the increase of water; we had been meeting with stones of copper in this level. We are now driving the deep adit level east of the eastern shaft, where the lode is 1 ft. wide, composed of quartz and flookan. In driving the deep adit north, near our western boundary, we have intersected a lode which may be Emily Henrietta lode, but we are continuing the cross-cut to prove this before sinking on it.]

EAST WHEAL RUSSELL.—W. Richards, Dec. 20: The machinery is working well now, and the water is being forked as fast as the pitwork will do it. The lode in the winze in the 66 will yield 2 tons of yellow copper ore per fathom. There is no change in the other points.

— Wm. Richards, Dec. 23: I am sorry to say the water is forking slowly, in consequence of so many lets at Hitchins's shaft. Since we have cut the north lode in the 130, east of the slide, the water has become so much more charged with copper and mineral salts that we cannot get the clacks or the packing in the stuffing-boxes to remain good but for a short time only; we shall be obliged, therefore, to have new-stuffing-boxes and glands, with brass linings and new seatings and valves for the H and door-pieces, before we shall be able to fork the water in a satisfactory manner. We have a brass working barrel in the new lift sent down in Homersham's shaft, which answers well, but the work in Hitchins's shaft must be altered as soon as we can obtain the necessary articles from the foundry. I am glad to say the lode in the winze in the 66 is producing fully 3 tons of ore per fathom, with strong indications for a continuance. The ground in the 66 fm. level cross-cut contains branches of yellow copper ore, which augurs well for the lode when it is intersected.

— Wm. Richards, Dec. 24: I beg to inform you that the lode in the deepest point reached in the winze in the 66 is 4 feet wide, and it will yield 3½ tons of yellow copper ore per fathom. The ground in the cross-cut in the 66 is strongly mineralised, with small branches of mundic and yellow copper ore. The lode in the 88 west is 21 in. wide, and contains some copper ore occasionally. There is no change in the other points. The water is forking slowly. I have ordered new stuffing-boxes, valves, &c., for Hitchens's shaft, and we will put them in immediately we get them from the foundry.

GAWTON COPPER.—George Rowe, George Rowe, jun., Dec. 21: We have not yet reached the main part of the lode in the 70 fathom level cross-cut; the ground in the present drivage is composed of hard capel, impregnated with good quality yellow copper ore. The lode in the 60 east is worth 2 tons of ore per fathom. The lode in the winze sinking below the 60 west is worth 3 tons of copper ore per fathom. The lode in the stopes in the back of the 60 west is worth 4 tons of ore per fathom. The lode in the stopes in the bottom of the 50 west is worth 4 tons of ore per fathom. The lode in the winze sinking below the 50, east of cross-cut, is worth 3 tons of ore per fathom. The lode in the stopes in the bottom of this level is worth 5 tons of ore per fathom. The lode in the stopes in the back of the 50 is worth 3 tons of ore per fathom. No. 2 stope, in the back of the same level, is worth 4 tons of ore per fathom. The lode in the 40 west is worth 4 tons of ore per fathom. The lode in the rise in the back of this level is worth 2 tons of ore per fathom. The lode in the stopes in the back of the 36 is worth 4 tons of ore per fathom. All other points of operation are progressing satisfactorily.

GLASGOW CARADON.—Wm. Taylor, Dec. 24: In the 78 west I have cut a cross-course, letting out a good deal of water which has drained a sink in the bottom of the 65, some 20 fms. ahead of this end, we have a good lode doing down there, in easy ground, where we shall at once sink a winze to effect a communication as early as possible. We have commenced to drive south on this cross-course; from the water coming in this direction we think the main part of the lode is there and we may have been driving on a branch. This is a very important point, which we shall soon prove, at any rate seeing we have drained the water from a course of ore; in the 65 shows that we are near the lode. No change in the cross-cut south; the ground continues very favourable. The stopes in back of the 65 continue to look very well.—New Lode: The 65 west is worth 8l. per fathom; east, shows signs of improving. I think we shall soon have a good lode here. The stopes in the back of this level are worth 8l. to 15l. per fathoms. We shall soon cut the south lode; in the extreme point in the end there is capel, which I think is on the wall of the lode; the water coming out of it is very strong. We are getting on very well with the next sample, we shall have about 200 tons.

GREAT CARADON.—F. C. Harpur, Dec. 21: We are progressing as fast as we possibly can with the sinking of the engine-shaft below the 72 fm. level; the ground, I am pleased to say, is a little more favourable for sinking than it was. All the machinery is in good order.

GREAT LAXEY.—R. Rowe, December 18: The engine shaftmen have not yet finished cutting out ground for penthouse, &c., previous to resuming the sinking of the shaft below the 220 fm. level. In the north ground the lode in the 220 end is worth about 50l. per fathom for lead and blende. In the 210, where we have of late made good progress in driving, the lode has not been so productive, now worth about 20l. per fathom; and in the 200 end it is small, having come to the "nip" which we had in the level above before the lode opened out into the wide and productive ground now being worked, and in which we have stopes above and below that level (the 190) worth on an average 80l. per fathom. The 190 end continues in a large and productive lode, especially for blende, the full size of which we do not at present know; and in the sump, sinking below this level, which for some time past has not been so productive, owing to the lode having suddenly become small, we have within the last few days a decided change for the better, as the lode is again widening, and producing good lead and blende. In the 180 end we have been cutting into the lode, but are not yet through to the hanging-wall, and we have already good lead and blende for about 2 feet in width, which will, in all probability, be increased by our next report. In the 165 we have, during the last fortnight, been taking down the lode in the side of the level, where, as expected, the most productive part stands now worth 80l. per fathom. The stopes in the roof of this level continue to be worth 150l. per fathom. In the 155 end we have now signs of approaching near to the slide, as looked for, there being a change in the ground, and the lode split into two parts, thereby lessening the present value of the end, but we believe a valuable part of the lode yet remains on the hanging side. There is no change in either of the drivings at the 145.—Dumbell's: The engine-shaft is sunk 9 feet below the 125 fm. level in a lode 8 feet wide, and in the middle of which there is at present a large horse of rock; the bearing parts of the lode may be valued at 50l. per fathom. The 125 end north is worth for lead and blende 100l. per fathom, and the same level south 50l. per fathom. The 110 end north maintains its value of 80l. per fathom, and the stopes behind it are worth from 80l. to 100l. per fathom. In the different levels and stopes above I see no particular alteration, excepting in the 85 south, where the lode, from being poor, has now improved to the value of 50l. per fathom, and all the other parts maintain their former respective values. The south ground is without change, except in the 60 fm. level, where the extreme south stope has improved to the value of 80l. per fathom for lead and blende. At Glenroy, the shaft being down for a new level, the men during the last fortnight have been occupied in cutting lodge and timbering the shaft, previous to driving out north and south on the course of the lode. We yesterday sampled 200 tons of copper ore, and on Saturday shall sample 100 tons of lead.

GREAT NORTH DOWNS.—W. Rich, C. Bawden, Dec. 24: The sinking of Sleggan's shaft is being urged on by 12 men as fast as possible; the lode is worth 15l. per fathom. The 74, east of Sleggan's, carries stones of ore. The 74 west is worth 20l. per fathom; we have about 3 fathoms to get under the No. 3 winze. The stopes in the back of the 74 are much as usual. The 59 west is worth about 10l. per fathom. The stores in the back of this level are worth 12l. per fathom. The 54, east of Butler's, is worth 6l. per fathom. The 54 west is worth 6l. per fathom. The 64 east is worth 15l. per fathom. The 64 west is worth 7l. per fathom. Butler's shaft is poor just now. We have cut through the lode at Vivian's fully 20 wide, and have commenced to open east on its course.

GREAT RETALLACK.—G. R. Odgers, Dec. 24: No. 1 Lode: In the engine-shaft sinking below the 20, in the south end of it we find the lode 2 feet wide, and from which I have to-day broken good stones of lead, having a more promising appearance. The lode in the 20 south is fully 2 ft. wide, and worth 3 cwts. of silver-lead to the fathom. The lode in the 20 north is 18 in. wide, of quartz, &c., with good stones of lead.—No. 2 Lode: The winze below the 20 is sunk to the 30, and we shall now commence the south end of it, where there is a good branch of lead. All the other places are progressing satisfactorily, and I cannot see any change from our last.

GREAT SOUTH CHIVERTON.—J. Nancarrow, J. George, Dec. 21: The lode in Gifford's engine-shaft is the same as last week, but the south or hanging side is very heavy, and letting out an unusual quantity of water, as if there were another lode coming down upon the one on which we are sinking; we hope to report more fully next week. The ground in the 40 cross-cut north is rather hard, but the driving is continued without intermission, and moderate progress is being made. The lead continues in the 30 west, and though there is not much to value we are evidently in a regular run of lead ground, which looks as well as the adjoining mines at the same depth, and which is likely to be very productive in the deeper levels. The lode in the 20 east is improving in appearance, and looks as if it would get into lead shortly. The water hitherto has not increased.

GREAT WHEAL BADDERN.—R. Pryor, H. Tregoning, Dec. 21: We have to-day again set the following bargains:—The 75 cross-cut to drive south of Hill Brothers engine-shaft, by six men, at 17l. per fm.; the end is still in the elvan course, and thickly impregnated with mundic and spar, but very spare for driving. The 75 fm. level to drive west of the cross-cut, by six men, at 4l. 15s. per fm.; lode much the same as when last reported on, and the end is still in a beautiful elvan; the men have made good progress at this point during the past month. Our pay and setting went off well.

GWYDYR PARK.—W. Smyth, Dec. 24: There is no particular change in Gwyn Llifon deep adit since last report; the lode is still letting out water. At Gwydyr, driving west, in consequence of the branches in the footwall being small, I have again put the men to drive west, where the lode is about 2 ft. wide, composed of spar, mundic, blende, and good stones of lead ore. I am carrying part of the country at the footwall side in driving.

HARWOOD.—Joseph Race, Dec. 20: The end of the level going north at Scar Head is very hard to drive at present. The stope east in north string is worth about 16 cwts. of ore per fm. The stope in south branch is worth 12 cwt. of ore per fm. The old level is progressing very well, they are timbering and laying the rails at present, in the open ground that they came to last week. We have 9 or 10 tons of ore dressed, and on the floors, and 5 tons more broken in the mine.

LONSDALE IRON ORE.—M. Boundy, Dec. 27: We have commenced driving north in the course of ore. I have bargained with the sumpmen to put the shaft in good working order, and drive 4 fms., for 20l.

LOVEL CONSOLS.—Wm. Chappell, Dec. 26: The lode at the shaft sinking below the adit is 18 in. wide, worth 7l. per fm., and improving as we sink, which is now 6 ft. below the bottom of the adit. From present indications the lode will more than pay for sinking the shaft. Before sinking any further we must fix the sinking lift and surface rods from engine-shaft. Our monthly cost will be easy, and the present prospects are cheering, such as have not been seen in the mine before.

MAUDLIN.—J. Tregay, Dec. 21: I am well pleased with the appearance of the new lode; as far as we have seen it is looking very kindly for making copper ore; it is in good killas ground; the lode is from 2 to 4 ft. wide, composed principally of gossan and quartz, intermixed with prian and mundic.

NETHER HEARTH.—William Vipond, Dec. 21: The Harriett vein contains nothing to value either east or west, at the top of the limestone. I think it will be best to begin taking up the stope we have at the north end, and see what we have below. The stope east on Henry's vein is looking easier for driving, and I am glad to say better for ore. We came to the ore yesterday, but I cannot say anything yet as to its value. We are timbering through a run, at present in the cross-cut to High Vein; I expect to be through it in a few days, when we shall probably see what the stope is like, nearly all the way to the High Vein. The London Company finished weighing the ore yesterday; they have got 28 bings. I think we could have dressed 15 bings more if the weather would have allowed, but there is no chance as it is. The washer and a boy have gone inside to the cross-cut again.

NEW CROW HILL.—Capt. Trelease, Dec. 23: The 70 cross-cut, towards the new winze, under the 55, and from this winze towards the 70 cross-cut, are progressing favourably, and I hope to see them communicated in a fortnight. Both stopes above the 35 are producing some good grey stuff, and if they continue as at present our next sampling will be better than the last.—Louisa Shaft: The cross-cut north, in the western end, is now in a dead part of the lode, though fine stones of lead ore have been broken this week. The eastern end shows a strong and kindly lode, and is yielding some excellent stones of lead ore.

NEW TRELEIGH.—Samuel Michell, Dec. 26: We have the wire-rope, and it will be in its place in the course of a few hours; and if all be well we shall soon have the shaft cleared to the bottom. The lode in the winze in the 10, west of Nicholson's, will turn out 30 cwts. of ore per fathom.

NEW WHEAL TOWAN.—R. Pryor, Dec. 26: The ground in the adit level driving west has undergone a very favourable change, and the lode in the end is looking more promising.

NORTH DOWNS.—F. Pryor, J. Grenfell, Dec. 21: The 60 to drive west by six men, at 7l. per fathom; lode disordered, the same being between the elvan and killas; this level may be looked upon as a very important point of operation, and should it turn out as we have a right to expect it will considerably enhance in intrinsic value. The stope in the back of the 60, and within 10 fms. of the end, by four men, at 2l. 10s. per fm., worth full 15l. per fm. The 50, to drive west by four men, at 5l. per fm., is a little improved, worth full 6l. per fm. The stope in the back of this level No. 1, within 20 fms. of the end, by four men, at 3l. per fm., worth 12l. per fm. No 2 stope, in the back of the same level, within 15 fms. of the end, by six men, at 2l. 10s. per fm., worth full 15l. per fm. A rise in the back of this level, and 25 fms. from the end, by four men, at 6l. 15s. per fm., worth 9l. per fm. The 40 to drive west by four men, at 4l. 10s. per fathom, worth 4l. per fm.; this end is improving in appearance, and is also important, the same being 42 fms. behind the 50 end. The 40 to drive east of Bennett's shaft, on the south lode, by two men, at 4l. 10s. per fm., producing good stones of ore. No tribute setting to-day. We shall sample at our next sampling our usual quantity, at all events sufficient to make a profit without in any way working to a disadvantage, as well as having due regard to pretty fair reserves.

NORTH PHŒNIX.—J. Seccombe, J. Martin, Dec. 20: The 160 to drive west, on the south side of the lode, by six men, at 7l. 10s. per fathom; there is no change in the ground in this end. The 140 to drive west, on the south side of the lode, by six men, at 6l. per fathom; the ground continues to be favourable killas, thickly impregnated with mundic and iron, in which there are also good stones of yellow copper ores. To sink the winze in the bottom of the 140 west by six men, at 12l. per fathom. The winze is down 13 fms., leaving about 6 fms. to sink to communicate it to the 160; when this is done, we shall have ventilation to permit of our cross-cutting the lode at that level.

NORTH TRESKERBY.—R. Pryor, J. Tregoning, T. Jenkin, Dec. 26: The lode in the 120 fm. level, driving west of the sump-shaft, is 2 ft. wide, composed of spar, peach, flookan, and stones of copper ore, and looking promising for an early improvement.—Tresidder's Shaft: The lode in this shaft, sinking below the 130 fm. level, is 4 ft. wide, composed of spar, peach, tin, and copper ore, worth 6l. per fathom—a very kindly lode. The lode in the 130 fm. level, driving east, is 2 ft. wide, producing a little copper ore, and letting out water freely, which we consider a good indication. The lode in the 120 fm. level, driving east, is 4 ft. wide, worth 12l. per fathom. No. 1 stope, in the back of this level, is worth 18l. per fathom; No. 2 stope is worth 16l., and No. 3 is worth 15l. per fathom. The 120 fm. level west is communicated to the 120, east of the sump; this will enable us to do away with one of the lifts in Tresidder's shaft, which will greatly ease our engine. The lode in the 110 fm. level, driving east, is 3 ft. wide, composed principally of capel and a little copper ore, but of no value. The lode in the winze, sinking in the bottom of this level, is 4 ft. wide, worth 2 tons of copper ore per fathom. The lode in the 100 fm. level, driving east, is 3 ft. wide, worth 1 ton of copper ore per fathom. All other places are much the same as for some time past.

NORTH WHEAL CROFTY.—J. Vivian and Son, W. Thomas, Dec. 24: In the 196, 183, and 170, west of Petherick's shaft, the lode appears to be increasing in size, and is producing tin stones of low quality. In the 150, west of Petherick's shaft, we have commenced sinking a winze, in which the lode is producing tin, worth 14l. per fathom. In the 196, east of Praed's shaft, we are still driving through the flookan lode, and have not yet reached the tin ground. In the winze sinking under the 183, east of Praed's shaft, we are down about 7½ fms., where the lode is 3 ft. wide, containing a great deal of mundic, chlorite, and quartz, and yielding tin, but being altogether of a lower quality than it has been. In the stope east from this winze, the lode is producing very good tin stone, worth about 50l. per fathom, and appears to be taking more to the south in going down than in the winze; it is possible, therefore, that we may find the most valuable part of the lode at the 196, in a south part or spice. The 183, east of Praed's shaft, has improved, and is now producing some rich tin stone, whilst presenting an appearance indicating further improvement. The stopes in the back of this level are worth about 20l. per fathom. In the 120 south, east of Rule's shaft, we have not yet intersected any lode.

OKEL TOR.—J. Rodda, Dec. 26: The south lode in the 80 east has become softer and larger, and at present it will yield 1½ ton of ore per fm., and promises an early improvement. The lode in the 65, west of Hele's winze, is still looking well, and will produce from 5 to 6 tons of ore per fm. Hele's stope, where we are stripping out ground for main stull, will yield 5 tons of ore per fm. The lode in the 50, west of the eastern cross-cut, is looking better, and is now yielding 2 tons of ore per fm., and promising further improvement. The stopes on the north lode are looking just the same as for some time past.

OLD GUNNISLAKE.—H. Rickard, Dec. 26: At Michael's shaft the water is in fork 9 fms. below the 71 fm. level, and all things going on well. The lode in the 21 fm. level west, on the south or green lode, remains without alteration at present, yet the appearances indicate an improvement shortly. The lode in the 31 fm. level, on the same lode, is still producing good stones of grey copper ore and opening up tribute ground. We are getting on with the enlarging and securing the 41 and 61 fm. levels west on the middle lode as fast as the nature of the work will admit; so far as we have gone the backs and bottoms of the levels are all taken away. We commenced dressing on Monday last a nice little pile of work, which I am glad to say is of good quality. We are pushing everything on as fast as possible, and hope shortly to have the mine in fork to the bottom. Our little whim will be in course for hauling to-morrow.

PEDN-AN-DREA UNITED.—W. Tregay, J. Thomas, E. Chegwin, Dec. 21: Sump: The lode in the 140 east rise is worth 15*l.* per fathom. The lode in the 130 east end is worth 5*l.* per fathom. The lode in the 130 west end is worth 12*l.* per fathom. The lode in the 120 west end is worth 15*l.* per fathom. The lode in the 100 east rise is worth 10*l.* per fathom.—Cobbler's: The lode in the 110 east is worth 5*l.* per fathom. The lode in the 110 west is worth 15*l.* per fathom. The lode in the 100 west winze is worth 10*l.* per fathom. In the 90 north end the branches produce stones of tin occasionally. The lode in the 90, west of cross-course, on the north lode, is worth 6*l.* per fathom.

PENHALLS.—S. Bennetts, W. Higgins, Dec. 20: The lode in the bottom of the diagonal shaft, below the 60 fm. level, although not quite so well as we have seen it, is, notwithstanding, a very promising lode below the gossan just passed through, and worth 12*l.* per fathom. Both in the rise above this level and in the 60 west end there is no change to notice. The 50 west, on new lode, also continues much the same as for some time past. The lode in the rise above this level is worth 14*l.* per fathom, and in the rise in the east side of the cross-course 12*l.* In the 50 west, on Pink lode, and 44 east, on same, there is but little alteration. In the old Pink Mine, the engine-shaft is apparently sunk 6 feet through and below a gossan about 1½ feet wide, but so far as can be seen the lode had not been met with in the shaft. It is probably thrown up some fathoms. It further appears that it is only the "top" or north part of the lode, or the workings on which, that can as yet be seen, every part being either filled with attle or mud, therefore, until some of this be cleared it will be impossible to say much on the general appearance of the mine.

PRINCE OF WALES.—J. Gifford, W. Gifford, Dec. 24: In the 65 cross-cut south, and the 55 cross-cut north, the ground is favourable for driving. In the 55 west the lode or part on which we are driving, for 6 ft. wide, is worth 25*l.* per fathom. In the 55 east the lode is worth 24*l.* per fm. The stope in the back of the 55, east of winze, is worth 15*l.* per fm. The stope in the back of the 55, west of winze, is worth 25*l.* per fm. The stope in the back of the 55, west of cross-cut, is worth 30*l.* per fm. In the 45 west the lode is worth 6*l.* per fm. The stope in the back of the 45 west is worth 10*l.* per fm. The rise in the back of the 45 east, against the new air-shaft, is very hard and spare for rising, and letting down much water.

PROSPER UNITED.—J. Nicholls, Dec. 26: The 100 fm. level ends, east and west, are without change. The winze in the bottom of the 90 east is worth 9*l.* per fathom for copper and tin. No alteration in the cross-cut south, from the 90 west. The stope in back of this level is worth 10*l.* per fathom for tin. The 80 east is producing 1 ton of ore per fathom. The 70 east is improving, now worth 1 ton of ore per fathom. The 60 east is producing 2 tons of ore per fathom. The winze in the bottom of this level is producing 1 ton of ore per fathom. The 60 west is poor. The 50 west, on the south lode, is producing ¼ ton of ore per fathom, and looking promising for improvement. The 40 west, on south lode, is worth 5*l.* per fathom for tin. There is no change to remark in any other part of the mine.

REDMOOR.—Thomas Taylor, Dec. 26: We have no particular change in the north or south cross-cuts since last report; the ground is moderately easy for driving, and letting out water, but as yet no lode worthy of notice.

ROARING WATER.—Capt. Thomas, Dec. 24: The sinking of Gilliman's engine-shaft, continues to be satisfactory, and every effort is made to increase progress, I am in hopes we shall soon see Grady's lode, and if the present character of rock continues, I have no doubt it will cut well. The machinery, &c., are in excellent working order.

ROSECLIFF AND TOLCARNE.—R. Pryor, T. Gundry, Dec. 26: In the 50 cross-cut, north of Lindo's engine-shaft, we are still meeting with small branches, which contain a little lead and blende; the ground in the end is more favourable for driving. No. 3 lode, east of the cross-cut, is still looking very promising, being 2½ ft. wide, producing good stones of lead. In this level west of cross-cut the ground is a little more favourable, and the lode has a better appearance; a great improvement may be shortly expected at these two points, and we are daily expecting to cut No. 4 lode.

ROSEWARNE CONSOLS.—J. Nancarrow, R. Knuckey, Dec. 21: The 80, west of engine-shaft, is now 70 fms. west of the western winze, and requires ventilation, to effect which we have commenced a rise in the back of the level, where the lode is worth 8*l.* per fathom. The 70, west of the engine-shaft, yields good stones of ore. The ground in Sarah's shaft, on the caunter, has been rather hard, but is improving. The pitches on the caunter look better than they did at the setting.

SORTRIDGE CONSOLS.—Robert Jackson, Dec. 26: In the 140, west of the shaft, the lode is 1½ foot wide, yielding good stones of ore occasionally. In the 140, east of the shaft, the lode is 3 feet wide, yielding good saving work, and looking very promising for further improvement.

SOUTH CONDURROW.—J. Vivian and Son, Wm. Williams, Dec. 21: King's shaft has been completed to the 82, and the lode has since been cut through in the level named, where we find it 6 feet wide, composed of friable quartz and prian, containing more native copper than we have ever before seen in the lode, together with traces of black copper ore, the appearance of the lode being more favourable than it has been in the shaft for some time. Before opening east and west on the lode we must cut a plat, &c., which will take about a fortnight. In the 71 east the lode is 1½ ft. wide, composed of quartz, black iron, and a little black copper ore. In the 71 west the lode is small and unproductive, and we think there may be a part standing to the south, which we shall ascertain by cutting in. In the 61 west we have broken about 40 tons of tinstone, a parcel of which has been sampled and assayed, by which we find it worth 1*l.* 3*s.* per ton, which, the lode being over 2 fathoms wide, will pay well for stoping. We have to-day arranged to commence rising above this level and sinking below the 51, to open a communication, and afford greater facility for stoping. In the cross-cut which we have driven south in the 51 west we have intersected the branch seen in the stope above, and find it producing a little copper ore, but it is small, and not worth pursuing. In the 51 west the lode is 3 feet wide, producing good stones of yellow copper ore—a promising lode. In Vivian's shaft, sinking under the 40, the lode is 1 foot wide, and unproductive. In the 30, west of Vivian's shaft, the lode is 2 feet wide, and yielding good stones of black and grey copper ore. The copper stopes are worth about 7*l.* per fathom. We sampled on Wednesday 56 tons of copper ore of good quality.

SOUTH DARREN.—J. Boundy, Dec. 21: In the 70 west the lode is 1 ft. wide, producing spots of lead and copper ore, and is of a very promising character. In the 60 west the lode is 3 ft. wide, composed of blue killas, spar, carbonate of lime, copper, and lead ore, worth 20*l.* per fm., and still looks well for a further improvement. In the 50 west the lode is 2 ft. wide, worth for lead and copper ore 18*l.* per fm. The stopes throughout the mine are producing fair quantities of ore. There is no particular change to notice in any other part of the mine. We are pushing on the dressing as fast as the weather will allow.

SOUTH DOLCOATH.—G. Lightly, Dec. 24: The lode in the rise in back of the 66 is about 1 foot wide—unproductive. In the winze in bottom of the 56 it is also 1 foot wide, containing stones of ore. A communication between these two points will probably be effected in a week's time. In the 56 west no lode has at present been met with. In the adit level east the lode when last taken down proved to be about 1 foot wide, containing good stones of ore, and of a very promising appearance.

SOUTH HERODSFOOT.—W. Goldsworthy, Dec. 26: Since my last we have put in bearers and cistern at the 86 fathom level. The men are now engaged taking up water, and making preparations to fix the standing-lift, which we hope to make all complete this week.

SOUTH WHEAL GRENVILLE.—G. R. Odgers, W. Bennetts, Dec. 21: The lode in the 30 west is split into two parts; the south one is 6 in. wide, of quartz, with stones of grey ore and mundic; the north part is 1 ft. wide, principally gossan. The lode in the 30 east is 18 in. wide, of quartz and gossan. We have holed the winze in this end from the 20, and the men will now prepare for sinking the engine-shaft below the 30. The lode in the 20 east is 20 in. wide, of quartz, gossan, and iron, in which we find spots of grey ore; this lode certainly looks promising, and one that any miner would expect to find producing copper.

ST. JUST AMALGAMATED.—R. Pryor, W. White, R. Wearne, Dec. 26: The lode in Saveall's engine-shaft, sinking below the 90 fm. level, has undergone a very favourable change in its appearance and character, being now worth full 11*l.* per fm. The lode in the 90 fm. level, driving east of shaft, is worth 6*l.* per fm.; and judging from present indications a still further improvement may be shortly expected. The lode in this level, driving west of shaft, is worth 5*l.* per fathom. The lode in the 76 west is still worth 6*l.* per fm.—Owl Lode: The lode in the 40 fm. level, north from Reddipper shaft, is worth 5*l.* per fm. The lode in the 20 fm. level, south of Saveall's lode, is still improving, now worth 5*l.* per fathom. We regard this to be an important point, as we are induced to think it is all in whole ground. All other places are without change worthy of notice since our last report. The sinking of Saveall's engine-shaft will be pushed on with all possible speed, which we fully believe will result in opening up a valuable property.

STEEPLE ASTON IRON.—J. Argall, Dec. 26: We are still raising ore, and have arranged for the cartage at less cost than we first estimated. I am now prepared to enter into a contract with the company for extensive workings, and on more favourable terms than first quoted. The works are looking well.

TAMAR VALLEY SILVER-LEAD.—John Goldsworthy, Dec. 26: The sinking of the shaft below the 10 fm. level progress satisfactorily, and will be down a sufficient depth for a 20 fm. level by the early part of next week, when a level will be commenced north and south, where we are looking forward to open up productive ground. The lode presents the elements of early success, the value of which I will advise you of when taken down.

TIN HILL.—W. H. Wilcock, Dec. 23: Having finished putting in the water-wheel, stamps, &c., and laying out our dressing-floors at the spot where we can command a powerful stream of water all the year round, we this week resumed our underground operations, and I have set the work to the men. The miners have undertaken to break down the lode, fill and rill to shaft, at 2*s.* per ton; hauling by horse-whim and landing at surface at 5*s.* per ton; spalling at 6*d.* per ton; carting to stamps is to be tendered for. I think no mine in the county will be able to work at a cheaper rate; this will leave us a good monthly profit. It must be borne in mind that our drivage is more like quarrying. We are carrying our level 19 feet wide in granite—otherwise the men could not make wages. We do not know the width or extent of the deposit, but shall before long drive cross-cuts north and south. I believe we have the proper title for our mine "Tin Hill," and trust it will prove so. There is a good pile of tin stuff stamped on the floors, the dressing of which has commenced; when a ton is ready for the smelters we shall send it away, as we have not a safe place at present to keep a quantity. It is my intention to put up another wheel, and machinery for eight heads more of stamps, and extend the dressing-floors, that our returns may be proportionately increased, that it may be stamped as fast as it can be raised.

VIGRA AND CLOGAU.—W. J. Holman, Dec. 26: This morning some stones, containing visible gold, were broken from the surface stope, west from No. 1 shaft, No. 2 winze; the lode still yields good work for stamping, and is 8 feet wide. The lode in the bottom of No. 4 sink, under the adit east, is 3 feet wide; the quartz is rather white, but mixed with iron pyrites, copper, &c. The cross-cuts from the bottom of No. 5 sink, under the adit west, are being pushed on rapidly; in the north cross-cut we expect to meet the branch in the course of a few days. The stope east from the bottom of No. 3 shaft is as last reported. In the drivage east from No. 1 shaft the lode still maintains a width of 6 feet, and has rather improved in quality. At the Vigra and Old Clogau Copper Mines the works are going on satisfactorily. At the reduction works 24 heads of stamps are at work.

WEST BASSET.—George Lightly, Dec. 24: Grenville's Shaft: In the 154 east the lode is 3½ ft. wide, worth 1½ ton of ore per fathom. In the 154 west the lode is 4 ft. wide, composed chiefly of fluor-spar, containing a little ore. In the 144 east the lode is 3 ft. wide, worth 1 ton of ore per fathom. In the 144 west the lode is 3 ft. wide, unproductive.—Thomas's Shaft: In the winze in bottom of the 65 the lode is 1¼ ft. wide, yielding good work for tin. In the 65, west of cross-course, the lode is worth 8*l.* per fathom for tin. In the 65 west, on the south part, the lode is worth 5*l.* per fathom for tin. There is no change worthy of comment in remaining points of operation. We sample to-day 193 tons of copper ore.

WEST CARADON.—Wm. Johns, N. Richards, Dec. 23: Allen's lode, in the 170, is looking very promising, and of a good size, composed of a beautiful soft quartz, spotted with yellow capel ores; we are forcing on this end by a full pare of men, and, although at a deep level, the present price for driving is only 4*l.* 4*s.* per fm., and by such indications we are looking forward for something good. The lode in the 155 to-day is not looking quite so good; however, we think it will again speedily improve. Clymo's lode, in the 128, west of cross-cut, is about 1½ ft. wide, chiefly quartz, and capel, but at present not containing sufficient ore to value. The ground on Jope's lode, in the 128, has considerably eased, and the lode as well seems to be improving. In the 116, on this lode, the end is still opening out moderate tribute ground. The sinking of Elliott's engine-shaft is going on as fast as the nature of the ground will admit. At Marina's shaft we have been cutting ground for a cistern-plat during the past week, in order to fix a plunger-lift before setting Pryor's engine to work, in which the lode is very regular; and as we are deepening the lode is showing a better appearance, with copper ore scattered throughout.

WEST DRAKE WALLS.—T. Gregory, Dec. 24: We are making satisfactory progress in sinking the engine-shaft, the ground in which is very good; present price 10*l.* per fathom. From the favourable nature of the ground there is every prospect of finding the lodes productive when intersected in the 40 or 50. The engine and pitwork are working as well as can be desired.

WEST KITTY.—James Evans, W. Vivian, Dec. 26: The deep adit end, driving west, is much the same as last reported on. The middle adit west lode is 10 feet wide, worth 26*l.* per fathom, and every appearance of an improvement. The stopes are much improved. Our next return of tin will be about 4 tons.

WEST PRINCE OF WALES.—J. Gifford, Dec. 26: No change in the mine to report on. All points in operation are progressing favourably.

WESTMINSTER.—F. Evans, Dec. 26: The eastern stopes, in the roof of the 70 fm. level, continue to look remarkably well for lead ore, and when I state that the ore ground alone produces 50 tons per month, you can form some idea as to its worth and value per fm. We have not yet been able to master the difficulty in connection with the sand in the shaft, as we have considered it advisable not to do much by it till we get another lift of pumps down, and which we think to accomplish by the latter part of the week; and should this prove as effective as anticipated, it will do away with the old engine for pumping. I hope it will do so, as it will be a great saving to the company.

WEST WHEAL TREMAYNE.—S. Roberts, Dec. 24: We are almost daily expecting to cut the south lode. The water is increasing in the cross-cut, and the ground looking kindly for copper ore. The water has not yet gone down in the winze in the bottom of the adit, on this lode. The men have commenced on tribute in the back of the 20 end, on engine lode. No change in this end. The ground in the north cross-cut is still getting harder.

WHEAL AGAR.—E. Rogers, Dec. 24: The lode in the 150 fathom level, east of flat-rod shaft, has a little improved, being now 18 in. wide, producing saving work for tin. The rise in the back of this level is holed to the winze sunk below the 140, which has ventilated the bottom level, and laid open the ground to stope at the best advantage. We have also communicated the rise in the back of the 140 with the winze sunk in the bottom of the 130. The lode in the 140 fathom level end, east of flat-rod shaft, is still producing good stones of copper ore—a very kindly lode. The flat-rod shaft is being sunk as fast as possible. Nothing new to report in the other parts of the mine.

WHEAL BULLER.—J. Inch, J. Brown, Dec. 24: Friday being our settting-day, the following bargains were set:—The 92 to drive east of Stevens's, to two men, at 11*l.* per fm.; the lode is worth 12*l.* per fm. The 92 east, on the north part, to six men, at 14*l.* per fm.; the end is unproductive. The 92 cross-cut to drive north, to four men, at 15*l.* 10*s.* per fm. The 80 to drive east, to four men, at 10*l.* per fm.; the lode is still in the elvan. A winze to sink under this level, to three men, at 10*l.* per fm; the lode in this winze is more kindly for tin. No. 1 stope, in the back, to six men, at 7*l.* per fm., worth 25*l.* per fathom. No. 2 stope to six men, at 7*l.* 10*s.* per fm., worth 25*l.* per fm. The 70 to drive east, to four men, at 11*l.* per fm., worth 7*l.* per fm. The 60 to drive west, to two men, at 3*l.* per fm.; this end will produce 1 ton of good copper per fm. A cross-cut to drive north in the 50, to two men, at 10*l.* 10*s.* per fm.—Hocking's: The 80 to drive east, to four men, at 13*l.* per fm.; the lode in the end is producing stones of tin and copper ore. The 70 to drive west, to six men, at 10*l.* 10*s.* per fathom, worth 10*l.* per fm. A winze to sink under this level, to four men, at 13*l.* per fm., worth 10*l.* per fm. A stope under the 60, west of Knuckey's winze, to six men, at 6*l.* per fm., worth 30*l.* per fm. A stope east of this winze to six men, at 6*l.* per fathom, worth 15*l.* per fm. A stope in back of this level to six men, at 5*l.* per fm., worth 10*l.* per fathom. Eleven pitches to thirty-five men, at an average tribute of 10*s.* in 1*l.*

WHEAL CREBOR.—J. Gifford, Dec. 23: On Saturday last the following bargains were set:—To cross-cut the lode in the 120 west by six men, 1 fathom or cut the lode, at 15*l.*; in this level we passed through two parts of the lode, one 2½ feet wide, and the other 3½ wide, composed of quartz and capels, with spots of mundic and copper ore intermixed, but of no value. In the present end of the cross-cut I think we have the south or main part of it; so far as seen it is very hard and poor. The 108 east, on the north lode, to drive by four men, stent the month, at 4*l.* 4*s.* per fathom; lode 2 feet wide, containing a little copper ore, although not to value, yet a kindly end. A rise in back of the 96 east to four men, stent the month, at 4*l.* 10*s.* per fathom, by the side of the lode. South lode in the 96 cross-cut to drive west of the cross-course by four men, stent 2 fathoms, at 4*l.* 4*s.*; lode 1 foot wide, composed of quartz, peach, and mundic, with occasional good stones of copper ore; this lode, so far as seen, is underlying south 2 feet in the fathom; and the Buctor lode, where seen in the tunnel, is 6 feet wide, with an underlie north of 4 feet in the fathom. I do not think the lode met with is the Buctor lode. We intend to drive a short distance west on its course to prove the character, bearing, and underlie of the same. The lode in Davis's pitch, in bottom of the 96 east, is 4 feet wide, worth 20*l.* per fathom. No change in any other pitches. We are getting on favourably with our dressing, and if the weather continues favourable we hope to sample near 300*l.* worth at the end of January.

WHEAL EMILY.—J. Rahey, Dec. 21: Since commencing operations we have cleared and secured upwards of 80 fathoms of the adit, reaching about 40 fms. west of Malichi's shaft; west of this shaft a great deal of the silver lode is standing in whole ground, the late manager having driven on a branch of the lode, leaving the silver-bearing part untouched, so that by blasting down the side of the adit, and by breaking away the silver-bearing part of the lode, we have a prospect of raising large quantities of rich ore. It is evident you have an immensely valuable property. As far as I can judge, I sent you a fair average of the lode in four samples, and I find from the report of Messrs. Johnson, Matthey, and Co., of Hatton Garden, that they yielded for silver as follows:—No. 1, 2338 ozs. per ton of ore; No. 2, 240 ozs.; No. 3, 536 ozs.; No. 4, 690 ozs.; worth on an average about 240*l.* per ton, a result far exceeding my expectations. There is another point of great interest near to the point we have reached. A very fine mineral lode will form a junction with the silver lode at an acute angle from the north, and it is confidently believed that by driving north a very short distance we shall reach a large mass of silver, similar to the junction previously discovered east of Malichi's shaft, and which made this property so celebrated for the production of silver, when shares reached upwards of 1000*l.* each. It was in this part that the lode made rich pockets of silver, in addition to the rich gossan, so rich that very large lumps, from ½ cwt. to 100 lbs. in weight, were found, which sold at 4*s.* 2*d.* per oz. in the rough.

WHEAL GRENVILLE.—G. R. Odgers, W. Bennetts, Dec. 21: The lode in the 130 east, on the caunter, is 2 ft. wide, composed of quartz and flookan, with branches of spar, containing copper ore, embedded in a very pretty granite, hence we have been expecting a productive lode for copper, judging from what we have seen in the upper levels. The lode in the 130 west is 2 ft. wide, composed of quartz and gossan, yielding tinny work, worth from 6*l.* to 7*l.* per fathom, and looking very kindly for a still further improvement. The lode in the 110 west is fully 5 ft. wide, composed of quartz, with mundic, black ore, and tin, worth for the latter 8*l.* per fathom. The indications here are very good. The lode in the winze sinking below the 100 west is large, and yielding good tinny work, worth from the last assay 25*l.* per fathom. In the 90 west we have not taken down any lode this week, but at the furthest point we have picked into the lode, where we find grey and black copper ore and mundic, which is a good sign. We hope to take this down by our next, when you shall be fully advised as to the value and appearance; this is also an interesting point. The lode in the winze sinking below this level is 4 ft. wide, worth fully 10*l.* per fathom. We have not met with anything in the 90 fm. level cross-cut. The tributers are breaking about their usual quantity of tinstone.

— G. R. Odgers, W. Bennetts, Dec. 26: All the places in this mine are progressing satisfactorily; but we cannot see any change since our last advise.

WHEAL KITTY (St. Agnes).—W. Polkinghorne, S. Davey, Dec. 21: In the 82, driving west of Holgate's shaft, the lode is much the same as last reported, worth for tin 4*l.* per fathom.—New shaft—Pryor's lode: There has no change worthy of remark taken place in this shaft sinking below the 82 during the week. In the 82, driving east of shaft, the lode is worth for tin 10*l.* per fathom. In the 82, driving west of shaft, the lode is also worth for tin 10*l.* per fathom with a better appearance. The lode in the winze sinking below the 65, on caunter lode is much the same as last reported, worth for tin 15*l.* per fathom. In the 65, driving west of shaft, the lode is worth for tin 9*l.* per fathom. In the winze sinking below the 65, no lode has been taken up since our last. The lode in the 44, driving east of shaft, is producing a little tin, but not to value.—Vottle lode: In the 24, driving east of cross-cut, the lode is very much improved, worth for tin 7*l.* per fathom, with every appearance of a further improvement.

WHEAL MARY ANN (Liskeard).—P. Clymo, Jos. Harris, Jas. Stevens, Jas. Skeat, Dec. 26: The cross-cut in the 230 is driven east of Clymo's shaft 10 fms. towards the lode. In the 220 north the lode is 2 ft. wide, worth 8*l.* per fathom. In the same level south the lode is 3 ft. wide, worth 15*l.* per fathom. In the 210 north the lode is 1½ ft. wide, and still producing good stones of ore. In the same level south the lode is 5 feet wide, worth 20*l.* per fathom. In the 200 north the lode is 2 ft. wide, worth 9*l.* per fathom. In the same level south the lode is 1½ ft. wide, worth 7*l.* per fathom. In the 190 north the lode is 3 ft. wide, worth 9*l.* per fathom. In the same level south the lode 1 ft. wide, producing stones of ore. In the 180 north the lode is 2 feet wide, worth 5*l.* per fathom. There is no change to notice in the 180 south since the meeting. The stopes and pitches are producing much as usual. We have this day sold two parcels of lead ore—No. 1 (computed), 58 tons, to Messrs. Stock and Co., at 23*l.* 12*s.* 6*d.*; No. 2 (computed), 42 tons, to Messrs. the Trustees of the Treffry Estate, at 14*l.* 12*s.* 6*d.* per ton.

WHEAL SPARNON.—W. Tregay, Dec. 21: North Shaft: The lode here is large, and produces stones of yellow and black copper ore.—Belfry Shaft: The south lode, in the 15 east, produces good stones of black and yellow copper ore. The lode in the 15 west is looking very promising, and produces good stones of rich grey copper ore.

WHEAL UNY.—S. Coade, M. Rogers, Dec. 21: The engine-shaft is sinking favourably, and we believe the lode is improving in depth. The 130 east is worth for 6 ft. wide 20*l.* per fm. The 110 east is worth for 6 ft. wide 8*l.* per fm. The 100 east is worth for 6 ft. wide 9*l* per fm. We expect to hole Goodinge's shaft to the 100 next week. The incline shaft is sinking favourably. The 130, west of incline-shaft, is worth 7*l.* per fm. The 120, west of incline shaft, is worth 9*l.* per fathom. We will send you a full report for the meeting on Saturday next, and the tin bill for the remainder of tin for the quarter.

FOREIGN MINES.

PESTARENA UNITED.—*Telegram:* Pallanza, Dec. 26: Second remittance this month, from amalgam obtained since the 7th, about 451 ozs. of gold, making the total remittance this month about 1500 ozs.

CAPE COPPER.—J. Williams, Nov. 9: Engine-Shaft: The sumpmen for the first two weeks were engaged in sundry jobs of work preparatory to sinking—putting in footway ladder, soliars, hanging tackle, putting in plat solar, and hauling the stuff that had accumulated in the bottom of the shaft, &c. The shaft is now 5 fms. 4 ft. 3 in. below the east level. The ground sunk last month was 3 ft. 1 in., at the rate of 48*l.* per fathom. Re-set Nov. 1 to six men and three labourers, at 48*l.* per fathom. At present the ground in the shaft is a very hard granite rock. No. 3 winze has been sunk during the past month 2 fms. below the east level in a very fine course of ore, and will now produce from 10 to 12 tons of rich ore per fathom; working by one man and three labourers, at 16*l.* per fathom.—Driving South: This level has been extended south on the flookan during the month 5 ft. in highly mineralised ground, and I am pleased to notice that the flookan, with the accompanying rock, is more favourable for driving, and has a very promising appearance; driving by two men and two labourers, at 13*l.* 10*s.* per fathom.—Driving North: This end has been driven north during the month 3 fms. 2ft. 4in. in a very promising mineral-bearing rock; driving by two men and labourers, at 8*l.* per fathom. No. 1 winze has been sunk during the month 2 fms. 2 ft. 4 in. in a splendid course of ore; this winze has been sunk in all from bottom of level 6 fms. 4 ft. Finding the water at this point so much increased that to do anything more would be working at a very great sacrifice, I thought it advisable to suspend operations until the winze can be drained by a level below from the engine-shaft, when the work can be performed at much less cost.—Surface Works: The carpenters and smiths are fully employed in putting a line of flat-rods from engine-shaft to the dam below the washing-floors, to pump the water with the engine instead of pumping it with mules, also in laying a tramroad from the crusher to the jigging-houses to tram down the crushed ore and shaft smalls. The road will be completed by the end of another week. October ore extract, 302 tons of 2352 lbs., averaging 33·89 per cent. The engine and pitwork are working well: 387 tons of ore were ridden to the coast during the month. [The Antonio Vinent has arrived at Swansea with 675 tons of ore, and bills of lading are received for 330 tons of ore per Ottawa, from Hondeklip; 37 tons of ore and 45 tons of regulus per Earl of Mar and Kellie, and 10 tons of ore per Constantia, from Cape Town. At Tuesday's sale at Swansea this company's ore realised 14*s.* 3*d.* per unit, and regulus 14*s.* 4*d.* per unit.]

MINING IN THE CHONTALES DISTRICT.—(*From a Correspondent in Nicaragua.*)—Since my last communication the whole aspect of the affairs of the Chontales Company has undergone a complete and favourable change. As I have already informed you, the cholera has entirely disappeared, and native labour will, therefore, quickly return. The commissioner of the Central American Association (the proprietors of the Javali Mine), has, I understand, solicited the privilege of being allowed to avail himself of the service established by the Chontales Company for the transit of mails, specie, stores, &c., from the seaboard to the mines, agreeing to pay for such advantage one-half of the contract price. A copy of Mr. Truran's report upon the Chontales Mines has arrived out here; and although the certificate of assays of the samples of ore which he took with him from the mines show such a high average percentage (excluding the "special sample from the 'nail'" in Consuelo, which yielded at the rate of 174 ozs. of gold per ton of ore), yet the result is not considered so satisfactory as Capt. Paul and the reduction officer had anticipated—in other words, knowing by their own practical experiments upon the ore the results it is capable of producing, they expected a higher yield by assay; but I hope to be in a position to furnish more specific information upon this point in my next letter. Rumour says that a statement has been made in England, to the effect that the machinery erected has proved ineffective, and that stamps should have been erected in the place of arrastres. If such a rumour has been circulated, it must have been set on foot by those altogether ignorant of the application of reduction machinery, or whose interest was not the success of the Chontales Company, for the quantity of ore already reduced testifies the practical adaptability of the machinery, while the statement made by Mr. Truran, in his report to the directors, upon the nature of the lodes, evidences the fact that the arrastra is the only effective appliance that could have been employed. Mr. Truran truthfully describes the character of the lodes when he states that they are large, and *generally of a soft nature*, thus enabling them to bring away large quantities when the appliances for crushing and dressing are erected. The various hindrances that have hitherto run counter to the immediately remunerative success of this extensive undertaking are rapidly passing away, and I have only to repeat what I stated in my last letter—"that the one thing required is a little more time."

MINING NOTABILIA

[EXTRACTS FROM OUR CORRESPONDENCE.]

The information received from OKEL TOR continues to speak most favourably of the mine, and, in consequence of its improved character, the adjoining sett westward—called West Okel Tor—has been obtained from the Duchy of Cornwall, and operations are to be commenced forthwith. This sett is between Okel Tor and Calstock Consols, and in the range of their valuable lodes; and, besides, it is intersected by an important lead lode, now being worked immediately on the opposite side of the River Tamar, to commence operations on which, in the pan of ground on this side of the river (and in this newly-acquired property), will greatly facilitate the discovery of the copper lodes, and probably be a source of remuneration to commence with.

EAST ROSEWARNE.—Captain Charles Glasson (Dec. 26) reports—At King's shaft, sinking below the 105, no lode has been taken down since my last report. I think when we do so it will be quite as good as it was in the stope above, worth 10*l.* per fm. In the 105, west of shaft, the ground is still very hard for driving, but I think as soon as we can get through this bar of ground we shall have a change for the better, as there is a good lode gone down in the bottom of the 95. In the 105, east of shaft, the lode is 15 in. wide, worth 6*l.* per fathom. In the 95, west of shaft, the lode is 12 in. wide, worth 4*l.* per fm. In the 95, east of shaft, the lode is 12 in. wide, worth 7*l.* per fm. In the 85, west of shaft, the lode is 8 in. wide, worth 6*l.* per fathom. We sampled on Monday last (computed) 190 tons of good copper ore, 57 tons more than we had at our last sampling.

It is satisfactory to learn that, in the general depression of mining, there is still some heart left in the community. We hear that a company is being formed, and is already in a forward state, for working GROGWINION MINES, ten miles east of Aberystwith, in Cardiganshire, the great lead mine of Sir Thomas Bonsall. This mine may be considered as a certainty with respect to its ore ground, which has been wrought down to within a certain depth of a deep adit, made in modern times for unwatering it. The western ground is 190 yards long, and very productive. This mine is similar to the Cwmystwith Mines, and it is thought by mining agents of experience will soon make similar profits, amounting to many thousands a year. A railway, the Milford Haven and Manchester, has recently been opened, with a station about a mile from the mine. It is thought that this is one of the best investments for money now offering, as far as can be judged from appearances.—SILURIAN.

FARADAY'S DISCOVERIES, AND THEIR RESULTS.—The entertainments and lectures provided at the Royal Polytechnic Institution for the Christmas visitors are more than usually numerous and attractive. Faraday's Discoveries and their Results are set forth in that lucid manner which would be impracticable at any other place of amusement. The early researches of Faraday in connection with the substance which afterwards gave the beautiful coal tar colours—mauve and magenta—were illustrated, and the effect of his early electrical discoveries upon the rapid progress in telegraphy subsequently made was pointed out. Through the assistance of Messrs. Tilly and Thomas, of Circus-place, Finsbury, and Mr. R. Collett, of the Anglo-American Telegraph Company, the visitors at the *conversazione*, held for permitting a private view of the Christmas novelties, were enabled to communicate with Newfoundland and other places during the lecture; and a message was actually sent to Heart's Content, and replied to through the Atlantic cable in rather less than ten minutes. The description of, and experiments with, Wheatstone's bridge attracted especial attention. The other entertainments are of the usual instructive and amusing character.

THE SOCIETY OF ENGINEERS.—The annual dinner took place on Friday last, when a very favourable account of the society's progress was given. The income for the year was 781*l.*, and the expenditure 546*l.* When all arrears of subscription are paid it will exceed 600*l.* The Royal Charter applied for during the year not having been obtained the society will be registered under the Companies Act, 1867, by which limited liability and the right to sue and be used can be obtained. The society will thus be in as good a position as if it possessed a charter, and its prosperity will be much increased.

In the Bank of England return for the week ending on Wednesday evening there was shown in the ISSUE DEPARTMENT an increase in the "notes issued" of 50,205*l.* represented by a corresponding increase in the "coin and bullion" on the other side of the account. In the BANKING DEPARTMENT there is shown an increase in the "public deposits" of 32,437*l.*; in the "seven day and other bills" of 16,745*l.*; and in the "rest" of 10,938*l.*: together 60,120*l.*; and a decrease in the "other deposits" of 234,280*l.* = 174,160*l.*, and adding thereto 299,747*l.*, the increase in the "other securities" on the asset side of the account, there is a total decrease in the reserve of 473,907*l.*

AUTOMATIC DAMPER.—The invention of Messrs. SCHOFIELD and SMITH consists of an apparatus constructed so to act upon the damper of steam boilers, so as to open and shut it by the pressure of steam in the boilers, and that one boiler shall be quite sufficient for any number of boilers.

CORNISH MINERS' WAGES—A HAPPY EXCEPTION.—Upwards of 1660*l.* was paid through the Union Bank, Helston, on Christmas Eve for the month's wages at the Great Wheal Vor Mines; and it is a surprising fact that no man in the mine received less than 3*l.*, and the average wages was upwards of 4*l.* for each man in the mine.—*Western Morning News.*

LONDON GENERAL OMNIBUS COMPANY.—The traffic receipts for the week ending December 22 amounted to 9664*l.* 6*s.* 10*d.*

NO MORE COPPER SMOKE—No. II.

The assertion made at the conclusion of the first article on this subject—that the change in the character of our copper imports from Chili, is not only inevitable but permanent in its nature—will be best proved by a consideration of the influences which have produced the change. And we shall find at the outset of this investigation two reasons why we no longer get copper in a mineralised form from thence, but as bar and regulus; reasons which are so powerful in an economic sense, that we can but wonder the effect has not been greater and more sudden than it has. The first and most important of these reasons is the saving effected in sending from such a distance high-produce material, as compared with that of low produce. The freight is calculated per ton whatever the produce may be, and the insurance is based on the value. If, then, the freight from the West Coast of South America to Europe varies from its present low figure of about 2*l.* to 3*l.* 15s. per ton, and if the average produce of the ores as they come from the mine's mouth is 17 per cent. we have here, if we reduce that ore to a state of regulus of 50 per cent., a saving of three times the cost of the freight of the day, whilst if it be reduced to the form of bar copper a saving of five and a half times the freight. The amount of saving here will, of course, be dependent on the rate of freight, but even with the present exceptionally low rate from the West Coast the advantage in favour of sending a high-produce material will be no inconsiderable one. In addition to the freight there are other charges saved, such as the handling of a smaller bulk of material, &c., intelligible to the general reader without especially detailing them. From all these savings must be deducted the cost of carriage—in all cases where the mines are not near smelting works—from the mines to the works. This charge, at first sight, may appear a large one, but practically it is very small, as much from the increased abundance of the shipping capacity of the Coast, as from the safety with which the most rotten ships can travel up and down in seas where it rarely blows beyond a gentle breeze. Still there remains the smelting charge to be added. This smelting charge is a quantity of unknown value, to the public at least, for there is the astounding fact, too often repeated for us to be unconscious of it, that the English smelters often give more for copper ore than for copper regulus, and more often for either than for bar copper. As to this charge, then, we may leave it out of the calculation, surmising with safety that it cannot be a large one.

The second reason why smelting will continue to increase on the West Coast of South America, is the fact that bar copper is an article of definite composition and of definite value, and one which almost all the world is now prepared to buy; whilst copper ore can only be bought by the English or American copper smelters. And without any desire to mislead, and it must be admitted in complete ignorance of the principles which guide the English smelters in buying, we, as miners, can only be astonished at the wide differences which often take place between the value of metallic copper and that which the smelters pay for the raw material. This uncertainty in the value of their produce has had a powerful effect in inducing the miners generally in Chili and Australia to smelt their ores before sending them to England. In the one case the miner sends to market an article of uncertain value, even as compared with metallic copper at the same time; in the other, he supplies a commodity usable by all the manufacturing world, and one, therefore, for which he is more likely to get a fair price. It must be admitted that the second influence is not so powerful in an economic sense as the reason first given, still it is one which must have some weight with the West Coast miners. It would not be difficult to give many other reasons in support of our statement, if such were necessary. For example, it will be easily understood by those best acquainted with trade that in all cases where the miners are not generally the exporters, as in Chili, and where they are dependent on the large merchants, it is greatly to their advantage to offer to the purchaser an article of easily ascertainable produce and almost definite composition, such as regulus or bar copper, rather than ore which is difficult to sample, or not easy to assay. Some of the smelters have attempted to lessen the effect of this by sending out an agent to buy produce on the Coast; but to suppose that they will produce the result they desire by any such means is as absurd as to suppose that they can compete, in a commercial sense, with the old-established general trading houses on the Coast. The effect, we believe, will be exactly the reverse of what they desire, and the purchasing by a direct agent there will rather hasten than retard the dreaded change.

Some drawbacks there undoubtedly are to the increase of smelting in Chili; such as the cost of fuel, which has appeared to some an insurmountable objection. No doubt the price of coal there raises the cost of smelting much higher than it is at Swansea or Liverpool; but Chili is rich in coal, and the general character of the ores to be smelted is very superior, and require much less fuel to convert them into metallic copper than do such ores as those from Cornwall. Another drawback is the high price which the West Coast smelter has to pay for material, labour, &c. The furnacemen are, as a rule, drafted from the English smelting works, and so may be supposed as equal in capacity and in knowledge of their work to any of the English smelters. In addition, the art of smelting is now so old on the West Coast, that there must be a race of young smelters springing up, so that they are no longer dependent on new immigrants. We may, in fact, surmise that the art of smelting copper will rather improve than deteriorate in the hands of the Chili smelters, since they have the strong incentives of the high prices of fuel and labour to urge them to experiment and study the economy of each in every stage of the process. One delusion they very soon get rid of—that the low-produce ores are necessary to smelt high-produce ores. This absurd notion has been repeatedly propounded by men who should have known better; and all that can be said is, that if the Cornish miner has not a better foundation for his existence in the market—and which we believe he has in the necessity of his produce as a not inconsiderable item in our supplies—he would be soon doomed to complete extermination.

That the change which we have described in the character of our copper imports from Chili, and which is an undoubted feature in the market at present, as shown by the figures we have given, will be permanent in its nature is to some extent dependent on the richness of the ore as it comes from the mines. Formerly a large proportion of the ore raised in Chili was of a very high produce, but the ore is not more than half as rich as it used to be, and if it continues of this kind the change to regulus and bar must be permanent, whilst if the average produce is much raised no doubt we shall still get some ore from thence. As a rule, it is undoubtedly true that where mining is spread over a large area, as is the case in copper mining in Chili at this moment, the bulk of the ore raised is not rich. But whilst we are ignorant of the laws which govern the deposit of metallic substances in the earth we are to a great extent working in the dark on this branch of our subject. The time may come when we shall discover these laws, and then, and not until then, will metallic mining become a certain science. To enter into theories which have been propounded from time to time as to the origin of metallic deposits is not the object of the present article, as we desire only to deal with facts, so we will return at once to the subject in hand, and pass on to consider what will be the effect of the change in the copper trade of England by this great revolution, for revolution it undoubtedly is not so much, perhaps, in the copper trade as in copper smelting.

*** With this week's Journal a SUPPLEMENTAL SHEET is given, in which appears our Annual Review of the Metal Trade—Mr. Warington Smyth's Lectures at the Royal School of Mines—The Government Inspection of Coal Mines: the Inspectors' Reports—The Ferndale Colliery Explosion—Foreign Mining and Metallurgy—The New Science: Atomechanics—Improvements in the Manufacture of Steel—Cornish Pumping Engines—Boring Machines for Cornish Mines—Lever's Mining Almanac—Liability upon Shares—Mining Leases—"Cwmdulais," or Graig Vawr Coal, &c.

*** With last week's Journal a SUPPLEMENTAL SHEET was given, in which appeared—Colliery Workings: the Double-Shift System, by Lord Kinnaird—Mines Inspection—Mine Inspection: Civil Service Examination—Safety-Lamps, and Colliery Explosions, &c.: No. II.—Ansell's Fire-Damp Indicator—Items of Interest from Nova Scotia—Boring Machinery for Mines, Tunnels, &c., by George Rickard—Rolling Girders and Plates—The Quebec Hydraulic Cement, by Major-General F. H. Baddeley—Slate Quarry Reports, by T. Harvey—The Llanfair Green and Blue Slate Quarry—The Progress of Mining, as a Science and Source of Commercial Wealth: No. XXIII.—The Calstock District—The Darien Canal, No. VII., by Dr. E. Cullen—Mining in Australia: the Moonta Mine—Mining in Australasia: Monthly Summary—Foreign Mining and Metallurgy—A Free Labour Society—The Silver Deposits of Lake Superior—Silver Mining in the United States—Coal in India, &c.

*** With the Journal of Dec. 14 a SUPPLEMENTAL SHEET was given, in which appeared—Mining Episodes in India, No. II., by George Henwood—Working Collieries, in South Wales, by John Nixon—Petroleum as Steam Fuel, by Arthur Barff—the Quebec Hydraulic Cement, by Major-General F. H. Baddeley, R.E.—The West Indian Islands, No. II., by G. J. Gunther—The Gold Mines of Canada, by Alexander Somerville—The Progress of Mining as a Science and Source of Commercial Wealth, No. XXII., by "M. F."—Increase of Public Interest in Mining and Mining Discovery, by Thomas Spargo—The Slate Trade in North Wales, No. XI., by Joseph Kellow—Slate Quarries, Practical Reports, by "A Quarry Partner"—Llanfair Green and Blue Slate Quarry Company, by T. Macdougall Smith, J. Haywood, E. Evans, and others—Prince of Wales Slate Company, by Thomas Harvey—The Cause of the Depression in Trade, by N. Ennor—Utilisation of Coke Oven Gases, by Jenkins and Rae—The South Kensington Museum, Patent Office Department, by "Engineer"—The Chontales Gold Company—Frontino and Bolivia (South American) Gold Mining Company—Furnaces for Smelting Copper Ores, by W. Bevan—The "Official List" and its Quotations of Mines Shares—Great North Laxey and its Management—Ticketing Expenses—Foreign Mines, &c.

The Mining Market; Prices of Metals, Ores, &c.

METAL MARKET—LONDON, DECEMBER 27, 1867.

COPPER.	£ s. d.	£ s. d.
Best selected..p. ton	75 0 0-	76 0 0
Tough cake and tile	74 0 0-	75 0 0
Sheathing & sheets.	78 0 0-	79 0 0
Bolts	83 0 0-	—
Bottoms	85 0 0-	—
Old (Exchange)....	66 0 0-	67 0 0
Burra Burra	79 10 0-	80 0 0
Wire.....per lb.	0 1 0-	0 1 0½
Tubes	0 0 11½	1 0

BRASS.	Per lb.
Sheets .....per lb.	9d.-10d.
Wire ..... ,,	8½d.-9½d.
Tubes ..... ,,	10½d.-11d.
Yellow Metal Sheath.p. lb.	7¼d.—
Sheets ..... ,,	6¾d.-

SPELTER.	Per ton.
Foreign on the spot. £20	5 0- —
,, to arrive .. 20	5 0- —

ZINC.		
In sheets	£27 0	0-28 0 0

TIN.		
English blocks	96 0	0
Do., bars (in barrels)	97 0	0
Do., refined.....	99 0	0
Banca	£90 0	0- 91 0 0
Straits	87 0	0- 87 10 0

TIN-PLATES.*	Per box.	
IC Charcoal, 1st qua.	1 6	0- 1 8 0
IX Ditto, 1st quality	1 12	0- 1 14 0
IC Ditto, 2d quality..	1 4	0- 1 6 0
IX Ditto, 2d quality..	1 10	0- 1 12 0
IC Coke.....	1 1	6- 1 2 6
IX Ditto	1 7	6- 1 8 6
Canada plates,p.ton..	13 10	0- —
Ditto, at works	12 10	0- —

IRON.	Per ton.	
Bars Welsh, in London	6 10	0- —
Ditto, to arrive	6 10	0- —
Nail rods	7 0	0- 7 10 0
,, Staffd. in London	7 10	0- 8 10 0
Bars ditto	7 10	0- 9 10 0
Hoops ditto	8 10	0- 9 12 6
Sheets, single	9 5	0-10 0 0
Pig No. 1, in Wales ..	3 15	0- 4 5 0
Refined metal, ditto..	4 0	0- 5 0 0
Bars, common ditto..	5 15	0- 6 0 0
Do. mrch. Tyne or Tees	6 10	0- —
Do., railway, in Wales	5 0	0- 5 10 0
Do., Swed. in London.	10 5	0-10 10 0
To arrive	10 5	0-10 10 0
Pig, No. 1, in Clyde..	2 13	0- 3 0 0
Do. f.o.b. Tyne or Tees	2 9	6- —
Do. Nos. 3,4, f.o.b. do.	2 6	6- 2 7 0
Railway chairs	5 10	0- 5 15 0
,, spikes	11 0	0-12 0 0
Indian Charcoal Pigs, in London p. ton..	7 0	0- 7 10 0

STEEL.	Per ton.	
Swed., in kegs(rolled)..	14 5	0- —
,, (hammered)..	15 5	0-15 10 0
Ditto, in faggots	16 0	0- —
English, spring	17 0	0-23 0 0
QUICKSILVER (p. bottle)	6 17	0- —

LEAD.	Per ton.	
English Pig, com.....	19 0	0-19 2 6
Ditto, LB.....	19 10	0- —
Ditto, WB	21 10	0- —
Ditto, ordinary soft†..	20 0	0- —
Ditto, sheet.....	20 0	0-20 5 0
Ditto, red lead	20 15	0- —
Ditto, white	27 0	0-30 0 0
Ditto, patent shot....	22 10	0-23 0 0
Spanish.....	18 10	0-18 15 0

* At the works, 1s. to 1s. 6d. per box less.

† A Derbyshire quotation: not generally known in the London market.

REMARKS.—The Metal Market has been exceedingly inanimate during the week, and very little business has been done. Prices generally are more in favour of buyers. [We refer our readers to our usual Annual Review of the Metal Trade, which appears in the Supplement to this week's Journal.]

BIRMINGHAM, DEC. 27.—Rylands' "Iron Trade Circular" says—Neither list prices nor wages were reduced at the Preliminary Meeting, for Staffordshire masters, taking a more cheerful view of iron trade prospects than Northern masters, are unwilling to disturb present friendly relations with their men. Pigs were dull, bars not quite so heavy.

MIDDLESBOROUGH, DEC. 26.—The "Iron Trade Review" states:—The Iron Trade is this week exceedingly quiet. Very few of the mills are in operation. The Pig-Iron market is inanimate, but prices remain steady. The stock in store is now 69,026 tons. There is little doing in warrants; they are quoted—sellers 44s., buyers 43s. 6d.

In the MINING SHARE MARKET this week there has been very little business done, partly owing to the general dulness, and partly to the Christmas holidays. Quotations remain about the same, and are for the most part nominal, though improvements may be noticed in West Chiverton, Wheal Chiverton, and Chiverton Moor. Transactions have also taken place in Wheal Seton, Wheal Grenville, Prince of Wales, Chontales, Great South Tolgus, North Treskerby, Clifford Amalgamated, East Wheal Grenville, West Basset, West Seton, and a few other mines.

The standard for copper ore, we regret to say, declined again on Thursday. West Chivertons have been in good request, at 66 to 68. Wheal Chivertons have also risen to 5, 5¼. Chiverton Moors keep flat, at 5¼ to 5⅝. Prince of Wales shares have been firm, and leave off 48s. to 50s.; the 55 west is worth 25*l.* per fm.; the 55 east 24*l.* The other points in operation are of about the same value as last reported. Chontales Gold, 3⅜ to 3⅝; Clifford Amalgamated, 5⅜ to 6; Drake Walls, ⅜ to ½; East Basset, 9 to 11; East Caradon, 4¾ to 5; East Gunnislake and South Bedford, 35s. to 40s. East Lovell, 8 to 8½; at the meeting a dividend of 10s. per share was declared. The profit on three months was about 1000*l.* Frontino and Bolivia, ⅜ to ⅝; Great Laxey, 17 to 17½, ex div. of 10s. per share. Great South Tolgus, 20s. to 22s. 6d.; Great Wheal Vor, 16 to 17; Marke Valley, 6½ to 6⅝; New Seton, 65 to 70; North Crofty, 2¼ to 2½; North Treskerby, 29s. to 31s.; Providence Mines, 26 to 28; South Caradon, 400 to 410; South Frances, 24 to 26.

East Grenville, 1⅝ to 2; the 110, west from engine-shaft, is 2½ ft. wide, worth 1½ ton of copper ore per fm., and looks like being near a course of ore. Stray Park, 3 to 4; Tincroft, 13 to 14; West Basset, 2 to 2⅛; West Caradon, 10½ to 11. West Frances, 9 to 10; an important point is coming off in this mine. West Seton, 190 to 195; Wheal Basset, 75 to 80. Wheal Buller, 15 to 17½. The 92, east of Stevens's, is worth 12*l.* per fm. Eleven pitches have been set to 35 men, at an average tribute of 10s. in 1*l.* Great Retallack, 2½ to 3. At the engine-shaft sinking below the 20, in the south end, the lode is 2 feet wide, yielding good stones of lead. Wheal Grenville, 24s. to 26s.; Wheal Mary Ann, 19 to 20; Wheal Seton, 82½ to 87½; Wheal Trelawny, 5½ to 6. East Russell, 27s. 6d. to 32. 6d.; the lode in the deepest point reached in the winze, in the 66, is 4 feet wide, and it will yield 3½ tons of yellow copper per fm. Great North Downs, 4¼ to 4½. The sale of copper ore on Thursday realised 2620*l.*; the 74 end is worth 30*l.* per fm.; other parts without change. Gawton Copper, 3½ to 3¾; the tutwork points in operation are worth in the aggregate 38 tons of ore per fm.; the lode in the 72, not yet cut through. East Rosewarne, 5s. to 10s.; the mine sampled for the two months 190 tons of rich ore; the bottom of the mine looks much better. East Carn Brea, 2½ to 2⅝; at the meeting the accounts showed a balance in favour of the company of 428*l.* 7s. 8d. Hingston Down, credit balance at the meeting was 566*l.* 0s. 4d.

Devon Great Consols sold last week 1752 tons of copper ore, which realised 7824*l.* 8s. 6d. The mine is divided into 1024 shares, upon which 1*l.* each has been paid (1024*l.*), and on each of these shares 1081*l.* has been paid in dividends, showing a total amount paid in dividends of 1,107,168*l.*, and the shares selling at about 400*l.*, or rather better than 400,000*l.* for the mine. Taking the market price and the dividends declared, the mine now shows on an outlay of 1024*l.* a value of 1,507,168*l.*

The tone of the Mining Market on the Stock Exchange has been, on the whole, satisfactory. St. John del Rey, Don Pedro, Rossa Grande, and English and Australian Copper shares have been in good demand, and have advanced. On the other hand, Chontales and Frontino and Bolivia shares have been more freely offered, and close rather easier. English mining properties, with a few exceptions, appear to be neglected for the moment, but, notwithstanding, maintain their value. The following are the closing quotations:—St. John del Rey, 57½ to 58½; Don Pedro, 2⅝ to 3 prem.; Rossa Grande, ½ to ⅝; Anglo-Brazilian, par to ¼ prem.; Chontales, 1⅛ and 1⅜ dis.; Pestarena, ¼ dis. to par. The directors of this company have received a telegram from their agent announcing a second remittance, of 451 ozs. of gold, making a total this month of 1500 ozs. This cannot be otherwise than satisfactory. What the cost of raising this may be we do not know at present, but the directors have agreed to publish the cost in future, so that the shareholders will then be able to judge how their finances stand. This company ought to be in a good dividend-paying state. Anglo-Italian, par to ¼ prem.; Port Phillip, 1 5-16ths to 1 7-16ths; United Mexican, 1⅜ to 1⅝; Panulcillo Copper, ¾ to 1; Capunda, 5-16ths to 7-16ths; Frontino and Bolivia, 13-16ths to 15-16ths; Central American, ⅝ to ¾ dis.; Yudanamutana, ⅞ to 1; Anglo-Argentine, ¼ to ½ prem.; English and Australian Copper, ¾ to ⅞. Chiverton shares have risen to 5⅛ to 5⅜, consequent on an improvement. Chiverton Moor, 5¼ to 5⅜; West Chiverton, 66 to 67, with an upward tendency. Great Laxey, 17⅛ to 18—not much doing. Great Vor shares steady, at 17 to 18; North Crofty, 2¼ to 2⅜; West Kitty Mine is favourably reported on; East Caradon shares more offered, at 4⅞ to 5; Marke Valley, 6¼ to 6⅜; East Carn Brea, 2⅛ to 2⅜; Prince of Wales, 48s. to 49s. Westminster (Limited), 5 to 5¼; the appearances at the mine augur well for a great future. Maes-y-Safn Mine is quite as rich as ever; Minera, 175 to 180; and the lead mines of North Wales continue to open up well.

IRISH MINE SHARE MARKET.—Since our last report nothing very remarkable has occurred in the Mining Share Market, unless we consider as such the satisfactory fact that in no instance has any heavy fall been experienced in market value, while no other securities have escaped the ill effects of several grave elements for disturbing the returning confidence of capitalists in the political or financial position of the Continent, and of our own country. The most prominent of these disturbers are, of course, the Franco-Italian question, Fenianism, and the Abyssinian war, the end and cost of which no one can predict; and last, though by no means least, the English railway panic, and a depressed metal market, each of which elements would of itself be sufficient to cause a considerable depression of the prices of mining shares, were it not that with us the respective holders of these securities are imbued with perfect confidence in their present intrinsic value and favourable promise for the future. With such a proof of high public appreciation, we may confidently anticipate that in a few weeks—when one or more of the difficulties referred to shall be reduced or removed—our mining share market will improve greatly, and that, therefore, the end of this year may be considered a desirable opportunity to invest in mining shares.

Next month will bring its usual batch of half-yearly meetings of shareholders in mining companies, when their financial positions and prospects will be made public, and the results may increase the demand for their shares. The Mining Company for Ireland has called a half-yearly meeting, to be held in Dublin on Jan. 2, and the Carysfort Mining Company has done the same for Jan. 6. For the last several days the present festive season has, as usual, greatly interfered with business of every description, and prices are, therefore, merely nominal. They may, however, be said to close as follows:—Mining Company of Ireland shares (7*l.* paid), at 16*l.* 10s. sellers, and 16*l.* buyers; Wicklow Copper Mining Company's shares (2*l.* 10s. paid), 17*l.* 2s. 6d. sellers, and 16*l.* 15s. buyers; Connorrees (20s. paid), 5s. 6d. buyers; General Mining Company for Ireland (5*l.* 5s. paid), 2*l.* buyers, 2*l.* 10s. sellers. In other mines nothing has been done.

CARYSFORT MINING COMPANY.—The report of the directors (to be submitted to the meeting on January 6) states that the lead mine at Ballintemple continued to improve both in the actual produce and in the prospects of an increased yield of ore. The lode consists, apparently, of a solid vein of lead, averaging 5 inches in thickness, increasing in width in the lower levels. Since the half-year's accounts 310*l.* has been realised, by the sale of 25 tons of lead ore. Ballinvalley Mine had been recently opened and unwatered, in order to inspect and repair the underground works; 6 fathoms further had been driven on the course of the sulphur lode, with promising indications; but, from the cost of drawing coal from a distance for working steam-engine, and the winter months coming on, the shaft was secured, and active operations ceased. At Coolahullin, at a small expense, some trials had been made upon a large lode, indicative of copper, and of a very promising character. The Aughrim lodes, not realising expectations, had been abandoned. The call of 5s. per share, made on the shareholders in August last, had produced, up to the present time, 2100*l.*, being one-half the amount of the call. This had enabled the directors to pay 1000*l.* of the loan raised with the bankers, and it was proposed to pay off a further sum, on loan, of 500*l.*, due January 5, which would leave a balance of 1000*l.* then outstanding. Works, however desirable to be efficiently carried on, cannot be proceeded with unless the shareholders put the directors in command of sufficient funds for the purpose.

The report of the mine manager (Mr. William Jones) states that, bearing in mind the importance of lessening expenses by continuous ore raising, he purposes in the first instance clearing the northern 10, 20, 30, and 40 fathom levels. The clearing had been commenced, and he had every expectation of finding in these levels several points from which additional ore bargains can be profitably opened. The supply to be thus kept up will considerably increase the immediate returns, and allow them to work with the view of attaining larger results hereafter, which can be done by the unwatering of lower levels, making ore searches from them, and finally deepening the shaft, and extending operations in whatever direction may be found most profitable.

The ITALIAN CONSOLIDATED MINING COMPANY (to which attention has been directed upon a previous occasion) has been most favourably received by the mining public. Allusion has been already made to the fact that before the prospectus was issued nearly one-half of the capital had been subscribed for by shareholders in the successful Pestarena United Gold Mining Company—the opinion of the managing director (who has had a long and extensive experience in Italian mining enterprise) being in accordance with that generally entertained by others who are practically familiar with the mineral resources of that country—which is, that a company possessed of sufficient capital, and formed for the purpose of developing under one management several promising mining fields, judiciously selected, has better chances of satisfactory results than one which is depending solely upon one mine for profitable returns. This opinion has been, no doubt, materially strengthened by the results now being realised by the Pestarena, Val Toppa, and Vallanzasca properties, which were selected under the direction of the managing director, to whom will be entrusted the practical supervision of the affairs of the Italian Consolidated Mining Company. The main features of the enterprise are, that as the mines selected are at a short distance from each other, they can be effectively placed under one management, and thus ensure economy in the general expenses; that the copper, silver, and lead mines have already been partially developed, and heavy expenditure has been incurred by their former proprietors, both underground and in the erection of plant (of which the company will reap the immediate advantages); that the virgin gold mining fields selected are in the vicinity of proved rich gold mines, and are so situated as to present the very best possible elements of great and

early success; that the arrangements under which the properties will be acquired will enable the company in the first instance to devote nearly the whole of the subscribed capital to their development; and that the paid-up share capital will for a number of years, and while the development of the properties is going on, be very small in proportion to their importance.

The prospectus of the JAVALI COMPANY has been issued to the shareholders of the Central American Association, but will not be brought before the public until the deposit money on the 40,000 shares, which the Central American shareholders expressed their willingness to subscribe for, has been paid. The remaining shares (of which a considerable proportion has already been applied for), will then be offered to the general public.

At the Swansea Ticketing, on Tuesday, 3108 tons of ore were sold, realising 41,691*l.* 8s. 0d. The particulars of the sale were—Average standard, 92*l.* 11s. 6d.; average produce, 18⅞; average price per ton, 13*l.* 8s. 3d.; quantity of fine copper, 586 tons 13 cwts. The following are the particulars of the sales during the past month:—

Date.	Tons.	Standard.	Produce.	Price per ton.	Per unit.	Ore copper.
Nov. 26..	1836	£93 11 6	19⅛	£14 1 7	14s. 5d.	£71 4 0
Dec. 24..	3108	92 11 6	18⅞	13 8 3	14 2½	71 1 0

Compared with the last sale, which is also the corresponding sale of last month, the decline has been in the standard 1*l.*, and in the price per ton of ore about 4s.

At Redruth Ticketing, on Thursday, 1835 tons of ore were sold, realising 10,056*l.* 1s. 6d. The particulars of the sale were:—Average standard, 104*l.* 2s.; average produce, 7⅞; average price per ton, 5*l.* 9s. 6d.; quantity of fine copper, 145 tons 2 cwts. The following are the particulars of the sales during the past month:—

Date.	Tons.	Standard.	Produce.	Per ton.	Per unit.	Ore copper.
Nov. 28....	2218	£105 9 0	7⅛	£5 5 6	13s 10½d.	£69 7 0
Dec. 5....	3395	112 1 0	6¼	4 6 0	13 8	68 8 0
„ 12....	1889	113 16 0	6¼	4 7 0	13 11	69 12 0
„ 19....	3852	117 16 0	5⅞	4 3 0	14 2	70 19 0
„ 26....	1835	104 2 0	7⅛	5 9 6	13 10½	69 6 0

Compared with last week's sale, the decline has been in the standard 3*l.*, and in the price per ton of ore about 4s. 6d. Compared with the corresponding sale of last month, the standard is about stationary.

The following dividends have been declared during December:—

Mine.	Per share.	Amount.
Great Laxey	£0 10 0	£7500 0 0
Maes-y-Safn	1 0 0	3000 0 0
Great Wheal Vor	0 7 6	2215 10 0
West Wheal Seton	4 10 0	1800 0 0
Whitewell	0 10 0	1500 0 0
Lisburne	3 0 0	1200 0 0
Wheal Seton	3 0 0	1188 0 0
Dolcoath	3 0 0	1074 0 0
Wheal Basset	2 0 0	1024 0 0
East Lovell	0 10 0	953 0 0
Wheal Mary Ann	0 17 6	896 0 0
Trumpet Consols	0 7 6	750 18 5
East Darren	2 0 0	600 0 0
Brookwood	0 2 6	500 0 0
Cwmystwith	2 0 0	256 0 0
Summer Hill	0 7 6	190 10 0
St. John del Rey	4 5 0	46,750 0 0
Total		£71,397 18 5

At Brookwood Mine meeting, on Dec. 20 (Mr. Matthew Loam in the chair), the accounts showed a credit balance of 106*l.* The profit on the four months' operations was 581*l.* 8s. 6d. A dividend of 500*l.* (2s. 6d. per share) was declared, leaving 56*l.* to be carried forward to the credit of next account. The agent reported that, on the whole, notwithstanding the ends being at this time poor, there were good reserves, and stopes looking pretty well; such, coupled with the fact that the sump-shaft is down to the 90, which will soon enable them to open up another level, made their present and future prospects very cheering.

At Wheal Rose meeting, on Dec. 19, the accounts showed a debit balance of 948*l.* 11s. 9d. The agents, in their report, strongly recommended sinking the diagonal engine-shaft below the 110 with all possible speed, as they fully believed they would soon get under the capel now in this level, as a similar piece of ground stands beneath the 40 and 60, beneath which the lode proved very productive, being worth in places from 50*l.* to 100*l.* per fm.; and also as they must be near the slide which has produced such beneficial influence on the lode in this district, is to them a sufficient reason for prosecuting it with the utmost vigour. The pitwork and machinery are in good condition, and the water is kept at about six strokes per minute. There are fifty men and four boys engaged on tutwork, and forty-two men and six boys on tribute, the total number employed being 175.

At Trelyon Consols meeting, on Dec. 18, the accounts showed a debit balance of 179*l.* 15s. 1d. The agents reported that the prospects of the mine were the same as they have been for the last six months. They estimate the returns will be sufficient to pay cost, with tin at its present price.

At New Bampfylde Copper Mine special meeting, on Dec. 18 (Mr. Charles Hand in the chair), it was explained that the total amount expended during the half-year upon new work or explorations was 407*l.*, of which 225*l.* was for sinking No. 4 shaft; and that having ch arged all against revenue, which it was submitted was the only proper and safe mode of keeping the accounts of a mine, the result of the half-year showed the company to be about 600*l.* worse off than at the meeting in June. The report and accounts were received and adopted, and the Chairman intimated that the directors had determined to accept no remuneration until the profits of the mine should be equal to any sum that might be voted, whereupon a resolution was passed that they should be paid out of the first profits such sum as the directors may think fair to appropriate as remuneration, the same not to exceed 200*l.* A special resolution was passed, increasing the qualification of the directors from 20 to 50 shares.

At the Russian (Vyksounsky) Ironworks Company meeting, to be held on Tuesday, special resolutions will be proposed to the effect that the 5632 returned shares of 20*l.* each shall be absolutely extinguished, and authorising the directors to issue 11,264 shares of 10*l.* each, upon which the same proportionate amount shall be deemed to be called and paid as shall have been, for the time being, actually called and paid upon the 20*l.* shares. The directors are also to be authorised to receive the whole or any part of the amount of such 10*l.* shares in advance of calls, and to give such guarantee on behalf of the company for the payment of such rate of interest or dividend upon such shares, and with such privileges and priorities as they may think proper.

On the Stock Exchange, a limited amount of business has been transacted in Mining Shares during the week. The following prices have been officially recorded in British Mining Shares:—Wheal Seton, 82½; Wheal Basset, 80; West Chiverton, 66½.—In Colonial Mining Shares the prices were:—Yudanamutana, 1 1-16th, 1⅛, 1 1-16th; Port Phillip, 1⅞, 1½; Cape Copper, 7½.—In Foreign Mining Shares the prices were:—St. John del Rey, 57⅞; Chontales, 3⅜, 3⅝; Don Pedro, 2¾, 2, 2 13-16ths, 2¾, 2 15-16ths prem.; Rossa Grande, ⅛, 9-16ths.

COAL MARKET.—The fresh arrivals this week only reach 13 ships. The Christmas holidays have, as usual, much restricted business, and the trade has ruled very dull, at about 6d. reduction in prices of both house and steam coals. Hetton Wallsend, 19s. 6d.; Haswell Wallsend, 19s. 3d.; East Hartlepool Wallsend, 18s. 6d.; South Hartlepool Wallsend, 17s. 3d.; Framwellgate Wallsend, 16s. 6d.; Seaham Primrose, 15s. 6d. per ton. Cargoes unsold, 18; ships at sea, 55.

THE COPPER TRADE.—Messrs. Vivian, Younger, and Bond (Dec. 27) write:—Business in West Coast produce has been confined to about 250 tons bars, which were taken at 68*l.* in Liverpool, at which price there are no longer buyers. No transactions in ores or regulus are reported. English is quite neglected, and offering at low prices. Little passing in fine foreign; in this metal, as in others, doubtless the holidays have had something to do with the paucity of transactions, and the disinclination to do business will most likely last into the new year.

NEW BLASTING-POWDER.—Referring to the frequent lamentable accidents with nitro-glycerine, Mr. NOBEL, the inventor, after pointing out that "our safety depends on our training," and that "whenever an article can be regularly manufactured it may be regularly used, and accidents are only the result of inexperience—the want or neglect of instruction," he writes that he quite admits that nitro-glycerine has its drawbacks, chiefly connected with its liquid state; but that this defect does not attach to his new blasting-powder—dynamite—which is a solid substance, possessed of the same power, less danger, and greater facility for use than nitro-glycerine. He expresses the hope that it will prove safe enough even for ignorant handling, and that its properties will become better known to the public at large than are those of nitro-glycerine, more especially as trials made lead to the anticipation that it will play a great part in national defences. It appears that a cask of dynamite "can sustain a shock sufficient to smash it completely, or be safely burnt over fire."

THE RUSSIAN (VYKSOUNSKY) IRONWORKS COMPANY.—It is satisfactory to find that this important enterprise is making satisfactory and remunerative progress. At the forthcoming meeting of shareholders, to be held on Tuesday next, it will be found that the company is earning very considerable profits; sufficient, in fact, to pay an increased dividend, were it not necessary to provide for the repayment of the debentures within a limited period, and this without reckoning upon the additional profit likely to be made from the Government railway contract and the Koulabak property. In September a call of 2*l.* 10s. per share was made, making 10*l.* paid on the 20*l.* shares; 4685 shares have been forfeited, on which 5*l.* only had been paid, and subsequently 210 were also forfeited. The shares of the company at the present date consist of 4348, of 20*l.* each, representing a capital of 86,960*l.*; the uncalled capital amounts to 43,480*l.*, and the debentures issued amount to 33,885*l.*

GOLD MINING IN ITALY—THE PESTARENA UNITED.—A telegram has been received from the managing director, to the effect that he has remitted to the office 451 ozs. of gold, from amalgam obtained since Dec. 7, making the total remittance this month about 1500 ozs.

DYNAMITE.—This substance consists of nitro-glycerine, in combination with a non-explosive material, such as charcoal, silica, paper, or similar materials, whereby it is converted into a powder which the inventor calls dynamite, or Noble's safety-powder. By this absorption of the nitro-glycerine in some porous supstance it acquires the property of being in a high degree insensible to shocks, and it can also be burned over fire without exploding. The dynamite is exploded, when under very close and resisting confinement, by means of a spark, or any mode of ignition used for firing ordinary gunpowder; or, secondly, without or during confinement by means of a special fulminating cap, containing a strong charge of fulminate, which is adapted to the end of a fuse, and is strongly squeezed to the latter for the purpose of more effectually confining the charge, so as thereby to heighten the effect of the detonation. By means of an additional charge of ordinary gunpowder the explosion of the latter will cause the dynamite to go off, even when it is only partially confined.

IMPROVED RAILWAY BRAKE.—The invention of Messrs. MARSDEN and BROMLEY is intended to actuate the brakes of railway trains by the pressure of fluids or liquids, through the medium of a novel arrangement and construction of mechanism that will, by self-acting means, when once put in action, gradually accumulate and exert an increasing pressure upon the wheels that will effectually retard and stop the train. The improvements consist in the novel application of a hydraulic apparatus, or other equivalent, in connection with one end of a powerful lever supplied with a clamp that will, when put in action, gradually force down the said clamp upon the top peripher of the wheels above which such clamps are placed, so as to give a constantly increasing pressure upon such wheels until a certain pressure is attained, and the train brought to a stand.

LEAD ORES.

Date.	Mines.	Tons.	Amount.	Purchasers.
Dec. 20—	Great Laxey	50	£21 10 0	Sims, Willyams, & Co.
—	ditto	50	21 10 0	Burry Port Company.
23—	Isle of Man Mining Co.	100	22 8 0	Sims, Willyams, & Co.
26—	Wheal Mary Ann	58	23 12 6	Stock and Co.
—	ditto	42	14 12 6	Treffry Estate.

BLACK TIN.

Date.	Mines.	Tons. c. q. lbs.	Price p. ton.	Amount.	Purchasers.
Dec. 20—	Penhalls	13 4 0 0	—	£726 0 0	—
23—	Great Wheal Vor	70 14 3 6	£4191 15 4	—	—

COPPER ORES.

Sampled Dec. 4, and sold at Swansea, Dec. 24.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Cape Ore	64	28¾	£19 15 0	Newfound...	47	12¾	£8 11 6
ditto	64	28⅞	19 10 6	ditto	46	12⅜	8 10 6
ditto	63	28¾	19 13 6	ditto	40	13¼	9 7 0
ditto	50	28½	20 1 6	ditto	51	11⅜	8 1 0
ditto	50	28⅜	20 4 6	ditto	50	11½	8 8 0
ditto	50	28¾	19 19 0	ditto	47	12⅜	8 8 0
ditto	50	28¾	20 0 6	ditto	39	11⅜	8 2 0
ditto	50	28⅞	20 2 6	ditto	44	11½	7 12 0
ditto	50	28⅞	20 2 6	ditto	31	9⅜	6 13 0
ditto	47	50¼	35 13 6	Moonta Ore..	117	17⅜	11 15 0
ditto	46	50½	35 13 6	ditto	95	17¼	11 15 0
Berehaven ..	80	9⅛	6 6 6	ditto	79	17⅛	11 13 0
ditto	62	9⅛	6 6 6	Del Soto	71	18⅝	13 2 0
ditto	80	9¼	6 10 0	ditto	70	18¾	13 2 0
ditto	66	9½	6 8 6	ditto	23	11¾	7 9 6
ditto	97	7½	5 13 0	ditto	1	20⅛	13 15 0
ditto	90	10¼	7 11 0	Ballycum. ..	92	8¼	5 3 0
ditto	70	10½	7 11 0	ditto	3	20⅛	14 6 0
Knockmahon	134	9¼	6 10 6	Copper Ore..	29	24¼	16 16 6
ditto	49	5⅜	3 14 6	ditto	18	15⅜	11 3 0
ditto	105	11¼	8 2 0	ditto	15	24¾	17 10 6
ditto	66	11¼	8 2 0	ditto	3	25	17 10 0
ditto	100	10⅜	7 5 0	ditto	2	24⅜	16 10 0
ditto	94	10⅜	7 8 0	ditto	2	19¼	13 5 0
Chili Reg. ..	53	41¼	29 5 0	Californian..	16	8	5 8 0
ditto	52	41¼	29 10 6	ditto	1	21	14 17 0
ditto	53	41½	29 10 6	Cape G. Hope	23	14⅞	10 10 6
ditto	52	41½	29 12 6	Copper Slag.	20	4	1 10 6
ditto	50	42½	30 0 0	Cape Ore	4	35½	26 10 0
ditto	47	39¼	29 3 0	ditto	4	25⅜	18 15 0
ditto	40	41¼	29 3 6	African Ore.	1	45¼	31 17 0

TOTAL PRODUCE.

Cape Ore	584	£13,098 15 0	Ballycummisk ..	95	£ 516 14 0
Bearhaven	545	3,598 5 0	Copper Ore	69	1,063 5 0
Knockmahon	548	3,862 11 6	Californian Ore..	17	101 3 0
Chili Regulus ..	347	10,227 18 6	Cape Good Hope..	23	242 1 6
Newfoundland ..	395	3,291 5 0	Copper Slag	20	30 10 0
Moonta Ore	291	3,411 7 0	Copper Ore	8	183 0 0
Del Soto	165	2,032 15 6	African Ore	1	31 17 0

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Copper Miners Company	39	£ 258 6 6
Freeman and Co.	262½	3117 9 9
P. Grenfell and Sons	65	1795 0 0
Sims, Willyams, & Co.	364	6363 10 0
Vivian and Sons	805	7455 1 0
Williams, Foster, & Co.	1008½	12038 0 9
Mason and Elkington	195	5859 10 6
Bankart and Sons	159	3129 18 6
Sweetland, Tuttle, and Co.	110	674 10 0
Total	3108	£41,691 8 0

TOTALS AND AVERAGES.

	21 cwts.	Produce.	Price.	Standard.
Whole sale	3108	18⅞	£13 8 3	£92 11 6

COPPER ORES.

Sampled Dec. 4, and sold at the Royal Hotel, Truro, Dec. 19.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Devon Great Consols..	128	£4 2 6	Gawton	50	£3 5 0
ditto	125	3 19 6	ditto	29	1 16 6
ditto	124	4 19 0	ditto	24	6 4 6
ditto	121	5 3 0	Brookwood	65	2 12 6
ditto	118	4 8 6	ditto	63	3 13 6
ditto	116	5 5 0	ditto	48	3 11 0
ditto	115	4 1 6	ditto	43	4 1 6
ditto	114	2 17 0	ditto	40	2 7 6
ditto	113	4 18 6	ditto	21	10 12 0
ditto	112	4 16 0	East Caradon	80	3 13 0
ditto	108	4 0 0	ditto	75	3 16 6
ditto	107	5 0 0	ditto	65	4 11 0
ditto	79	5 9 0	Okel Tor	100	1 17 6
ditto	73	2 17 0	ditto	60	3 6 6
ditto	57	5 1 0	ditto	40	6 10 6
ditto	56	3 2 6	Wheal Crelake	68	3 9 6
ditto	27	2 3 6	ditto	50	3 10 6
ditto	24	12 10 6	ditto	48	6 1 6
ditto	21	1 7 6	Prince of Wales	50	4 14 0
ditto	14	6 4 6	ditto	47	6 8 6
Marke Valley	83	2 15 6	ditto	40	6 5 0
ditto	80	3 14 6	Wheal Friendship	58	6 13 0
ditto	78	3 19 6	ditto	40	6 13 0
ditto	70	3 15 6	ditto	22	1 12 6
ditto	69	3 19 6	Bedford United	51	3 13 0
ditto	41	2 14 0	ditto	42	3 12 6
Gawton	85	2 19 6	Gonamena	30	2 18 6
ditto	79	3 3 6	ditto	20	7 13 6
ditto	62	3 3 6	Bilstone Mine	21	9 0 0
ditto	51	1 6 6	Fursdon	12	5 10 0

TOTAL PRODUCE.

Devon Great Con.	1752	£7824 8 6	Prince of Wales..	137	£ 786 19 6
Marke Valley	421	1487 12 0	Wh. Friendship..	120	687 9 0
Gawton	380	1132 19 0	Bedford United..	93	328 8 0
Brookwood	280	1065 7 6	Gonamena	50	241 5 0
East Caradon	220	874 12 6	Bilstone Mine	21	189 0 0
Okel Tor	200	648 0 0	Fursdon	12	66 0 0
Wheal Crelake ..	166	704 3 0			

Average standard ..... £117 16 0 | Average produce 5⅞
Average price per ton £4 3 0
Quantity of ore ..... 3852 tons | Quantity of fine copper.. 226 tons 3 cwts.
Amount of money £16,046 4 0
LAST SALE.—Average standard ..... £113 16 0—Average produce 6¼
Standard of corresponding sale last month, £113 8 0—Produce, 6⅞.

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Vivian and Sons	846	£2179 2 9
Freeman and Co.	146	655 15 0
Grenfell and Sons	512	2812 1 0
Sims, Willyams, and Co.	468½	1755 1 9
Williams, Foster, and Co.	788⅓	3252 7 0
Mason and Elkington	157	781 14 0
Bankart and Sons	157½	966 18 6
Copper Miners' Company	373⅓	1563 15 9
Charles Lambert	101⅓	283 2 0
Sweetland, Tuttle, and Co.	302	1256 6 3
Total	3852	£16,046 4 0

Sampled Dec. 11, and sold at Tabb's Hotel, Redruth, Dec. 26.

Mine.	Tons.	Price.	Mine.	Tons.	Price.
South Caradon	76	£4 1 6	West Wheal Damsel..	14	£2 11 0
ditto	70	6 14 0	ditto	2	1 10 0
ditto	67	4 18 0	CliffordAmalgamated	75	2 4 6
ditto	62	13 14 0	ditto	67	3 10 6
ditto	60	1 14 6	ditto	60	2 2 6
ditto	57	11 19 0	ditto	15	3 3 6
ditto	53	6 1 0	Phœnix Mines	74	3 4 6
ditto	51	10 17 6	ditto	68	2 7 6
ditto	43	6 1 0	West's Ore	56	3 17 6
Great North Downs..	102	5 9 0	ditto	50	6 8 6
ditto	92	6 17 6	ditto	12	10 18 6
ditto	80	6 9 6	Treffry's Regulus	38	10 0 6
ditto	77	7 2 0	Craddock Moor	35	6 13 6
ditto	70	5 5 0	Polharmon	34	4 6 0
West Wheal Damsel..	52	5 10 0	Tywarnhaile	10	4 3 6
ditto	43	4 0 6	Wheal Leisure	10	2 9 0
ditto	40	4 3 6	Grambler & St. Aubyn	6	3 6 0
ditto	39	4 1 6	Old Pembroke	3	3 16 6
ditto	38	1 14 0	Moss's Precipitate	2	8 0 0
ditto	32	4 12 6			

TOTAL PRODUCE.

South Caradon ..	539	£2876 9 6	Craddock Moor ..	35	£ 233 12 6
Great No. Downs.	421	2620 12 0	Polharmon	34	146 4 0
West Wh. Damsel	260	1037 0 6	Tywarnhaile	10	41 15 0
Clifford Amalgam	217	578 3 6	Wheal Leisure ..	10	24 10 0
Phœnix Mines ..	142	400 3 0	Gram. & St. Aub.	6	19 16 0
West's Ore	118	669 7 0	Old Pembroke	3	11 9 6
Treffry's Regulus	38	380 19 0	Moss's Precipitate	2	16 0 0

Average Standard ..... £104 2 0 | Average Produce 7⅞
Average Price per ton £5 9 6
Quantity of Ore ..... 1835 tons | Quantity of Fine Copper, 145 tons 2 cwts.
Amount of Money £10,056 1 6
LAST SALE.—Average Standard ..... £117 16 0.—Average Produce 5⅞
Standard of corresponding sale last month, £105 9 0.—Produce, 7⅛

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Vivian and Sons	461½	£1547 8 9
Freeman and Co.	105	702 12 6
Grenfell and Sons	176½	1006 12 6
Sims, Willyams, and Co.	208	2208 7 0
Williams, Foster, and Co.	357½	2088 9 9
Mason and Elkington	122	653 10 0
Copper Miners' Company	142	693 5 6
Charles Lambert	194	887 3 0
Sweetland, Tuttle, and Co.	68½	268 12 6
Total	1835	£10,056 1 6

Copper ores for sale at Tabb's Hotel, Redruth, on Thursday next—Mines and parcels.—Clifford Amalgamated 666—West Wheal Seton 570—South Wheal Frances 253—East Pool 144—Wheal Basset 109—South Wheal Crofty 95—Carn Camborne 58—South Condurrow 56—North Grambler 50—Nangiles 50—North Roskear 40—West Great St. George 38—Cocking's Ore 19—South Wheal Basset 10—Tolcarne 7.—Total, 2165 tons.

Copper ores for sale at Tabb's Hotel, Redruth, on Thursday week—Mines and parcels.—Prosper United 411—Wheal Margery 194—West Basset 193—East Rosewarne 190—East Carn Brea 165—Copper Hill 93—Camborne Vean 20—Wheal Buller 20—West Briton 20—West Wheal Tremayne 18—Wheal Curtis 15—Buglehole's Ore 14—Huthnance's Ore 9.—Total, 1362 tons.

A SLIGHT REVIEW.—In addition to the great blow given to public confidence in almost every kind of investment or speculation, by the failure of finance companies and banks, and, lastly, by the state of railway accounts, mining during the past year has had to contend against low prices for metals, the comparative poverty in many mines, and the winding-up of numbers of others. It is not our intention, however, to write a general review; we shall merely glance at a few prominent features, and refer to a few promising mines. First let us look at the difference between "limited," finance, or discount companies, banks and railways, such as have come to grief, and mines. In the former the public invested, not as in speculations, but, as they thought, in sound commercial undertakings, where their money was safe, and their incomes secure; and the awakening from their dream has been sad and heartrending. Not only, in many instances, has all invested been lost, but liabilities, never dreamt of, have involved hundreds of families in total ruin. Mining morality has not for many years stood high. Commercial morality has at last come down very low indeed. We know, and have often published the fact, that *mining* is a complete speculation. Everyone, therefore, who embarks in it *knows what he goes into;* and we advise no one to put more money into mines than he can afford to lose, or without full and proper enquiry, and the probability is he may do well, supposing he has made a fair selection, and divided his risks judiciously. Mining, however, requires *time*, as well as caution and money; and we are all apt to get out of heart at long-repeated "calls," with, apparently, no results at the mines, and, perhaps, sell out in disgust, just before brilliant results may be obtained. The story of East Caradon has been pretty well worn out, but the fact of many selling in despair at 1s. 6d. just before the mine cut rich, and shares rose to 50*l.* each, illustrates many others, and renders it difficult how to act or advise in all cases put before us. Some shareholders cling on to almost hopeless concerns, while others are given up, *perhaps*, in the right time, but just as likely at the very time they should have been held on. One thing at the present moment is clear—the market has been pretty well *weeded*, and at no time that we remember during the last 30 years has there been a better chance for investors, or the mere speculators. 1. Dividend mines, under good management, and with good prospects, can be bought to pay 10 per cent., and with a prospect of a rise in price besides.—2. Progressive mines can be pointed out, with fair prospects of rising 50 or 100 per cent.—3. There will always be market mines, which fluctuate every day and every hour, and which people who gamble or speculate for the "account"—that is, to take or receive differences—go into and call mining. Most of the fluctuations in shares, that puzzle the uninitiated so much, are owing to these gambling transactions. During the past year these fluctuations have been very great, but we have not had many permanent rises in value; the most noticable have been Prince of Wales shares, which were 26s. in January, and rose to 70s.; Great Retallack shares rose from about 1s. to 5*l.*; Carn Brea, from 8*l.* to 28*l.*; Great Fortune, nothing to 7*l.* We shall, probably, give a few particulars of the most prominent mines next week, and continue the series from week to week.

"X."—We are in arrear with several correspondents, but will make it up soon.

CHONTALES.—Everything we have written upon this concern has been based upon the reports, statements, and estimates of profit in the original prospectus; and which those who have been sent out for the purpose have reported would be realised. We could have sold our shares at 2 prem., but have held on *from the first*, without losing confidence in *ultimate success;* though we confess we are greatly disappointed at the time required to bring it about.

SATURDAY, DEC. 21.—Market very dull, and prices nominal. Chiverton Moor rather better. Prince of Wales, 48s. to 50s.; Chiverton Moor, 5⅜ to 5⅝; Chontales, 3¼ to 3½.

MONDAY.—Market a little more active. West Chiverton, Chiverton, and Seton shares in demand; Grenville, Great South Tolgus, and Frontino flatter. West Chiverton, 66 to 68; Chontales, 3¼ to 2⅜; Chiverton Moor, 5⅜ to 5½; Prince of Wales, 48s. to 50s.; Wheal Chiverton, 5 to 5¼.

TUESDAY.—Scarcely anything doing, and prices stationary. Chiverton Moor, 5½ to 5⅝; Chontales, 3⅛ to 3⅜; Prince of Wales, 48s. to 50s.; West Basset, 2⅛ to 2⅜; West Chiverton, 66 to 68; East Wheal Grenville, 1¾ to 2; Marke Valley. 6⅛ to 6½.

THURSDAY.—Holiday.

FRIDAY.—Market quiet. Prince of Wales, Chiverton Moor, Chiverton, West Chiverton, East Russell, and Great South Tolgus chiefly dealt in. Prince of Wales, 48s. 6d. to 50s.; West Chiverton, 66 to 68; Chiverton, 5 to 5¼.

Notices to Correspondents.

*** Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be *filed* on receipt: it then forms an accumulating useful work of reference.

NITRO-GLYCERINE.—Having just read an extract from the Journal on Nitro-Glycerine, I beg to express my sense of the valuable information therein contained. But there is a term or name of an article used, which I, and I am sure many others (like myself, engaged in mining operations), do not understand, and I fear our ignorance on the subject might lead to disastrous and sad effects in the blasting of limestone or other minerals in our mining operations, and it is of vital importance that there should be no misapprehension or mistake as to the article meant. The term I refer to is "Wood Spirit." I am quite aware of various articles being distilled from wood, but do not know of any that are made or used in this quarter, and known under the name used.—J. WILSON (of Huriet Coal, Lime, and Ironstone Works, near Glasgow).

[Wood spirit is the popular name for pyroxylic spirit or wood naptha—the hydrous oxide of methyle. It certainly ought to be well known in Glasgow, as it has been made there for the last half-century.]

MINING MATERIALS—PRICE OF NORWAY TIMBER.—I regret the remarks of "J. G.'s," respecting the prices paid for Norway Timber in this as well as in other mines in the district, was not observed by me in time to reply in last week's Journal; but that the public may see he did not make the necessary enquiries before writing, I beg to state that the last lot of Norway we bought was from Messrs. Bayly and Fox, at 37s. per load of 50 feet, delivered on the mine, while at the same date we received from Messrs. Gill and Sons, through Mr. Vivian (then their agent), the price as follows:—For cash 34s., credit 36s. per load at Merwellham, carriage named to be 6s. 3d. per load extra.—WM. GEORGE: *Tavistock, Dec.* 21.

SOUTH WALES INSTITUTE OF ENGINEERS.—We are compelled to postpone until next week our report of the proceedings at the annual meeting at Aberdare.

POWERS OF LIQUIDATORS.—Is there any way of compelling liquidators to realise concerns, and pay part at least of the debts? or can they keep them in their hands for any length of time, paying themselves well, and keeping the creditors out of their money? It seems to me that some *great* liquidators want vigorously stirring up; I can hardly think the law sanctions such queer work. —MINER: *Mold.*

GOVERNMENT SCHOOL OF MINES.—We shall endeavour in next week's Journal to bring Prof. Smyth's Lectures up to time of delivery.

THE MINING JOURNAL,
Railway and Commercial Gazette.

LONDON, DECEMBER 28, 1867.

THE FERNDALE INQUEST.

The more important portions of the evidence given at this inquest have already been published in the Journal. In the present remarks, therefore, attention need only be called to the facts elicited, and which, if permanently remembered, should go far towards making coal-mining less hazardous than it now is. If there be one lesson more than another to be learnt from this terrible fatality, it is that referred to in the Journal of Dec. 7, when, in remarking upon the state of things which had then been made known in connection with the accident, the importance of discipline in all the operations of a mine was dwelt upon. The jury were perfectly justified in their conclusion as to the cause of the explosion, and in attributing the accumulation of gas to the neglect of Mr. WILLIAMS and his subordinates. The facts, also, supported the conclusion that the gas was "fired by one or more of the colliers carelessly taking off the tops of their lamps, and working with naked lights."

Without discussing the often contradictory statements of certain of the collier witnesses, it may be taken as established that there was gas in JOHN DAVIES'S level, Blaenllecha, and the Rhondda main level, where gas was seen on the Tuesday before the explosion. Again, Mr. WALES stated that the pit was evidently subject to sudden outbursts of inflammable gas by "blowers." The discharge being often intermittent, so that a place may be quite free and safe at one time and yet highly dangerous shortly afterwards. Then, most of the pit was worked upon the long-wall principle, under which the only escape for gas issuing from gobs or goafs was up or down into the faces where the men were working. This being so, "the greatest possible amount of air should be passed to the faces. Shot firing should not be allowed, and the strictest discipline, especially with regard to the safety-lamps, should be enforced." Mr. WALES, taking the figures of Mr. ADAMS indicating the quantity of air passing into the pit from the seven different currents, concludes that 100,000 ft. per minute reached the coal faces, and that that quantity, properly distributed, ought to have been sufficient to thoroughly ventilate the mine in its normal condition. But the Inspector does not seem to be satisfied that that was the condition of the pit at the time of the explosion.

Mr. RICHARD BEDLINGTON, and other colliery managers, believe that the ventilation in JOHN DAVIES'S level was interfered with by two trains getting off the rails, and keeping open two doors leading into the return courses, and that a great accumulation of gas ensuing, it was fired by a naked light in a neighbouring stall, where the box of a lamp was found with the gauze off. Mr. BROUGH, however, whilst agreeing with Mr. BEDLINGTON in the probability that the gas ignited at an open lamp, could not concur with the conclusion that the doors were kept open for some time by the falling over of the trams, and expressed the fear that there was quite gas enough in the Globach district to account for the explosion without opening those doors, or any other doors at all. The air in the pit, it is clear, ought to have been sufficient to properly ventilate the workings, and the proprietors of the colliery have spared no expense in placing at the disposal of their officers as much air as should be demanded; but the examination by the Government Inspectors of Collieries after the accident led them to fear that the wind was sometimes throttled, as they found it in two or three of the stalls in DAVIES'S level. The quantity of air all around the face of those workings ought to have been ten times more than the 1500 feet per minute found. It is true that at that time the ordinary state of things might have been interfered with, but Mr. BROUGH seems to entertain the belief that such a condition of circumstances, or something like it, existed before the accident. If it did, then the fault was not with the owners, but it attached to the viewership. There was abundant evidence that the lamps were clandestinely opened, and it may well be hoped that they were all locked, yet in the Rhondda district lamps were found unlocked, but not opened. The fact of a collier having opened his lamp had been brought to Mr. WILLIAMS'S knowledge, and the man was fined 10s.; but, notwithstanding that the pit was of so firey a nature, he was not taken before the magistrates. From 500 to 540 lamps were in the pit at the time of the explosion. Each collier was allowed two lamps, but when two men worked together they had three lamps between them. One lamp (a Clanny) belonged to the collier himself, and the other (a Davy) to the proprietors. The men were allowed to buy their lamps where they pleased. No complete register was kept of the men in the pit, and any collier regularly employed there might take down to assist him whom he pleased. Neither barometer nor thermometer was kept in the pit, and an anemometer was used only about once a month by Mr. WILLIAMS.

It was about once a month, too, that Mr. ADAMS visited the colliery, to consult with the resident managers as to ventilation, &c.; but the resident manager could adopt or reject his suggestions, as he pleased. The coal was blasted, Mr. WALES said, with proper regard to the 37th rule, which gave the manager power to let the men fire their own shots. One collier witness had, however, previously made the extraordinary statement upon this point that everybody fired shots when they liked; that he fired his own, and that he obtained a light by holding his lamp at an angle, and applying touch-paper to the gauze, where it ignited.

With such a state of things existing in a new and fiery district, drained of its gases only by this colliery, the marvel is that such a catastrophe has not occurred earlier. Messrs. DAVIS, however, have the satisfaction to know that to the system of working which they adopted in one portion of their colliery is due the preservation of at least 100 lives. The present chief proprietor, through the death of his father, has been called away from the general superintendence of the collieries since May last year; and Mr. ADAMS has been the consulting engineer only since last March.

Every colliery proprietor will sympathise with Messrs. DAVIS in the difficulties which doubtless beset them upon finding an extensive and rapid demand arising for their coal at a time when certainly an abundance of good colliers were not to be got, and when first-class managers are not easy to be obtained. There can be no doubt that men of this latter class readily obtain engagements, and that, therefore, the demand is above the supply. Attention must be given to the training of colliery managers, and their duties must henceforth be regarded as of the greatest moment. These managers must be supported by subordinates of a class proportionately efficient. Till officers of the class desired can be obtained, consulting engineers must have more power entrusted to them, and exercise a more frequent and a stricter personal supervision both below and above ground. The barometer, the thermometer, and the anemometer must be in frequent use, and there must be daily registers and reports made of their indications. The jury, in the expression of their opinion that the inspection of collieries as hitherto practised has entirely failed as a preventive to accidents of this kind, and in their recommendation that collieries should henceforth be inspected by a competent person at least once in every three months, appear to have been influenced by the error to which attention was drawn in the Journal of Dec. 7, where it was shown that management and inspection were often confounded. Much will be effected if the recommendation with reference to scientific instruments be carried out in connection with improved management.

The report of Mr. BROUGH, as might have been expected, draws forcible attention to the theory of such accidents being in some way connected with meteorological influences; this point was prominently mentioned when the accident occurred, and mining engineers should now be more than ever observant of the use of the apparatus. Mr. BROUGH intimates that such have been the defects recently exhibited in the safety-lamps now in use, that the explosion might possibly have happened without the lamps having been opened at all.

Mr. BROUGH'S report, which is published in full in the Supplement to this day's Journal, contains an interesting account of his examination of the pit, and some useful suggestions for the future.

IRON-MAKING IN FRANCE.

The views entertained by Mr. I. L. BELL and other English ironmasters of eminence who have personally enquired into the extent of the permanent competition which English ironmasters will have to experience from those of France have received striking corroboration through the visit to France of Mr. ABRAHAM HEWITT, the eminent ironmaster of the United States, who is visiting Europe to report to his Government upon the effect chiefly of trade combinations, at the same time that he is collecting information peculiarly serviceable to the business order of which he is a member. As the readers of the Journal are aware, Mr. HEWITT, some time ago, gave evidence before the Trades Union Commissioners relative to Union combinations and other phases of the labour question in his own country. Since that time he has been to France in furtherance of the double object which he has in view; and the iron makers of this country are indebted to him for his readiness to communicate for their benefit the result of his enquiries. Upon his return from France he kindly consented to again give evidence before the Commission; and British ironmasters will be interested in reading the verbatim notes of his evidence when they appear in the customary official form.

As might have been expected, Mr. HEWITT paid particular attention to what was being done at the immense works at Creusot by Messrs. SCHNEIDER and Co., who have 15 blast-furnaces, and whose rolling-mill is 1400 ft. long. He believes that the great bulk of their ores comes from Algiers and Elba. The two were not similar in character, inasmuch as whilst that of Algiers was all magnetic oxides, the Elba was all peroxides. The character of the pig-iron at Creusot is in some respects better, but also in some respects worse, than that of the pig-iron which Mr. HEWITT has found in England His remarks applied alike to the ore from which the pig-iron was made, and to the grey nature of the iron. When the Frenchmen work this very grey iron they make five or six heats. Of white iron, however, they make the enormous quantity of eleven heats, which is nearly double what we do here. The eleven heats represent 2½ tons, and it is worked by one puddler and two helpers, without there being anything extraordinary in the build or character of the furnace. Mr. HEWITT at first entertained the opinion that the furnace must have been of a peculiar character, and he interrogated young Mr. SCHNEIDER upon the subject—"What peculiarity have you in your furnace that enables this extraordinary work to be done?" The reply was—"None; the iron works very fast?" This white iron was used exclusively for making rails, of which 30,000 tons are produced at Creusot in a year. Seven different qualities of manufactured iron are made there, and the total output of the mill is 110,000 tons per annum, inclusive of the rails. In the production of these qualities different mixtures are, of course, used, and labour varying in amount is expended upon them. Mr. HEWITT examined the iron with care, and he had never seen more beautiful material or better workmanship done anywhere. Mr. HEWITT also examined the machine-making department of the Creusot establishment. He had also seen Mr. SCHNEIDER'S products in the Paris Exhibition, including a specimen engine, one of 40, made for the Great Eastern Company, in England, and he regarded it as a beautiful piece of workmanship. Engines were being built at the works when he was there, and his inspection of that department had led him to conclude that there was no better machine-work done in the world, and that there was no establishment in the world on a grander or more perfect scale.

"The most marvellous thing" that Mr. HEWITT "has seen in Europe," he found at the Creusot Works, where the average wages of the men in the machine shops—the larger portion of whom were skilled machinists—was 2s. 10d. a day (3·40 frs.) He was so surprised that he enquired of Mr. SCHNEIDER whether there was not some mistake about it; but he was assured that that was the real fact. The average wages of the men employed about the rolling-mill was a little over 3s. 2d., the exact amount being 3·83 frs. Around the blast-furnaces the workpeople received an average of ½d. less than 2s. 6d. (2·95 frs.) The coal miners received 2s. 8½d., and the ore miners a little over 2s. 9d. (3·33 frs.) These figures had been published by Messrs. SCHNEIDER and Co. as the wages they paid in 1866. The average for the miscellaneous labour was a little over 2s. 6d. (3·03 frs.) The average paid for the whole of the 9950 workmen employed at Creusot was 2s. 10½d. a day. The tables did not show the specific prices paid for specific branches of labour; but at Sireuil, another French ironworks, Mr. HEWITT procured that information. For common labourers the average is 2s. 1d. per day. This also is the price paid for the same class of service at Creusot. At Sireuil and at Creusot wages paid to the puddlers also are alike: they are 6s. 8d. a day. At Sireuil the puddlers' helpers get the same as is paid to labourers. The puddle-bar rollers and the shinglers each get 4s. 2d.; the heaters, 5s. 10d.; the heaters' helpers, the same as labourers; the finishing rollers, from 5s. to 5s. 10d.; and the machinists, from 2s. 6d. to 2s. 11d. The machinist at Sireuil was a rougher class of workman than he at Creusot, though he was a very good workman. A labourer at Sireuil told Mr. HEWITT that his wages of 2s. 1d. per day enabled him to have meat only once a week. This meat meal he took upon the Sunday. He conversed with a puddler at Sireuil, who got his 8 frs. a day, and the workman said that out of that 6s. 8d. he had meat every day, and saved half his wages, so that the difference (1s. 3d.) between the proportion of his wages which he spent and the total wages earned by the labourer enabled him to have meat every day, whereas the labourer could get it only on the Sunday. This same puddler was a married man, and had children. Wages were not brought down by women being employed at the works, for Mr. HEWITT did not see one woman occupied at them. Associations of workmen, he was told, were not known in the provinces. There was at Creusot a benefit society, the funds of which were obtained by an assurance at the rate of 2½ per cent. upon the wages of all the people in the works. This fund, he understood, was administered by the proprietor.

The price of iron in France was about 1*l.* per ton higher at the works than the corresponding prices in England; but, inasmuch as the French ironmasters had to import their ore from a long distance, the expenses of that importation more than counterbalanced the advantages of the 1*l.* per ton, notwithstanding that the railway charges for transporting the ore from Marseilles to Creusot were even less

than ½d. per ton per mile. Mr. SCHNEIDER has stated in a recent publication that the result of the investment at Creusot has been that the stockholders have received 8 per cent. per annum, besides laying by a fund for extensions and renewals. But that gentleman told Mr. HEWITT that the business at present was unprofitable. The proprietors of the works at Sireuil likewise told him that they were making no money in the manufacture of iron in France. The statements of Mr. SCHNEIDER'S publication and his *viva voce* utterance to Mr, HEWITT might be reconciled in the circumstance that the manufacture of locomotives, for instance, might be productive of gain, whilst that of the dry iron might be attended by a loss. The necessity for importing a very large proportion of the ore used in France was one of the leading elements in the explanation that, notwithstanding that wages were at the lowest point, notwithstanding that the most excellent supervision and management existed, notwithstanding that a manufactured article was most excellently turned out, yet that "almost no profit was made." Mr. HEWITT testified that in his judgment the wages of labour are as a general thing in proportion to the natural advantages which any country possesses for the manufacture of the goods. He was sure, from his general comparison, that the making of iron in France was attended with no profit, and that it was impossible for the masters there to give any higher rate of wages than they were now giving. "I, therefore, come to the conclusion (said Mr. HEWITT) that the iron business in France rests upon the essential condition of giving meat to the labourers only one day in the week. That is the conclusion to which I have been driven from the facts which have come under my notice."

We have here a further testimony of greater worth than that of any non-practical, however critical, authority of the slender foundation upon which the success of the French iron trade is built. "Favoured as we are by Nature" (we repeat the words of Mr. BELL), we say, as we have before said in the Journal, that it were a shame if we should be beaten in the competition we experience from other countries in "this noble branch of manufacturing science." There is a tariff in France upon English and also Belgian iron; but, owing to the superior natural advantages which the British ironmaster possesses for the manufacture of iron, the French masters are compelled to reduce their wages below the standard of wages in England, even with the tariff which they have, in order to keep up any competition. It would be a sad day for England that found the wages of her artizans reduced to the level prevailing in France. The Frenchman, whose labour is his capital, has, however, been ready to co-operate with the Frenchman who has money, in an endeavour to introduce into their country, for their common benefit, an industry not natural to it, and in so doing have been prepared to receive for their combined labour and capital a return much under that for which, in respect of a nationally germane industry, they have a right to look. This state of things in France we regard as similar to that which should exist in England at a time when, as now, the iron trade is struggling hard to hold its own. There must be mutual concessions, and "a thorough belief in the inseparable union of the interests of each." Every practical man will be struck by the reversal in France of the state of things existing in this country in regard to the proportion which the emolument of rollers bears to that of puddlers. May not an explanation be found in the double work which these men render, as compared with the English puddlers, when they are working white iron, assisted, it will be perceived, by two underhands? Is it impossible for English ironmasters to produce eleven turns of white iron? Mr. WM. MATHEWS, the commissioner, who possesses more knowledge of the iron trade than any of the panel, thought it was impossible. Hence, during Mr. HEWITT'S examination, he asked the secretary of the Cleveland Ironmasters' Association if it were possible to turn out eleven heats in a puddling-furnace with any amount of labour which could be applied in England? Mr. JONES responded, "I think not." But if we possess, as we believe we do, that which Mr. BELL has described as "operative skill unsurpassed in any iron-producing country in Europe, then we affirm with all confidence that what a French puddler has accomplished an English puddler can likewise do. If we have not any pig-iron sufficiently white, then let it be got, and let the experiment be made. We commend the matter to the ironmasters of Cleveland and Wales, between whom there is a thoroughly brisk competition in the rail market.

STEAM-BOILERS.

Steam-boiler explosions have again taken place somewhat numerously, both here and in the United States. Conspicuous amongst the latter is one which has laid waste an American ironworks, with disastrous results to the poor workmen. One of the most recent of the accidents of this class at home was that which occurred on Monday, in Manchester, when a Cornish boiler, ten years old, built upon a mid-feather, divided in the centre, and made a complete wreck of the establishment of Messrs. CHAPMAN and HOLLAND, dyers and finishers. Six people were killed, and four others were injured. Previously to this accident the explosions in the month which had come under the observation of the chief engineer of the Association for the Prevention of Steam-Boiler Explosion in the Manchester District were 15. Six of these had resulted in the death of fifteen persons, and as many others injured. Particulars of four of these fifteen accidents have been obtained, and it has been found in them, as in previous cases, that there is no mystery about the cause. For the present we particularise only one, which is of especial interest to most of our readers. The accident happened at a colliery, and resulted in the death at once of three men and the injury of eight others, some of them very severely. Relative to this accident, the chief engineer (Mr. L. E. FLETCHER) says:—

"With regard to the cause of the explosion, I saw no reason on visiting the scene to attribute it to shortness of water or excessive pressure of steam; while it was stated that the safety-valves were blowing freely shortly before it occurred, but I found on examining the fragments that the rent was not entirely a new one, but had existed at the bottom of the shell for some time. The surface of the fracture at the top of the boiler presented a sharp and fibrous appearance, while that at the bottom was smooth and the edges rounded; added to this, the plate in the vicinity of the rent at the bottom of the boiler was eaten by external corrosion to a depth of one-sixteenth or one-eighth of an inch, the rivet heads also being affected, and it appears most probable that this corrosion was due to continued leakage through the old fracture. Whether, however, this corrosion was due to this cause, or to any other that escaped observation, an examination of the plate left no room for doubt that a portion of the rent which eventually cut the boiler in two had been of long standing, and gradually developing, so that the boiler had been tottering on the eve of explosion for some time, and merely needed some trivial exciting cause, such as the turning on of the steam, or feed, the opening of the furnace door, or a slight increase of pressure to bring about the catastrophe already reported. Externally-fired boilers are very prone to these treacherous fractures at the ring seams of rivets, and they may occur at any moment without warning. Hence one of the great objections to these boilers. The introduction of the feed-water has much to do with the rending of these boilers at the ring seams, and in the present instance the arrangement was not judicious. The feed was pumped into the boilers cold from an adjoining reservoir, and carried down nearly to the bottom of the shell by means of a vertical internal feed-pipe, placed but a few feet behind the fire-bridge, so that the cold water impinged directly on to the plates at one of hottest parts of the boiler, and it was at the nearest seam but one to this point that the rupture occurred. Sometimes merely opening the furnace doors and admitting a rush of cold air is sufficient to rend these boilers at the ring seams of rivets near to the fire-bridge, and in the present case the boilers had been fired up but a few minutes before the explosion occurred. I cannot conclude the report on this explosion without urgently repeating the appeal to colliery owners, so frequently made on previous occasions, that they would give up the use of these treacherous and uncontrollable plain cylindrically externally-fired boilers, and adopt the internally-fired double furnace boiler instead; while, as temporarily remedial measures, I would recommend that the feed should be dispersed on its introduction, by means of a horizontal perforated pipe, carried near to the surface of the water, and heated, if possible, before being pumped into the boiler. Also, that the ends of the boiler should be lashed together longitudinally, to prevent transverse rupture, resulting in explosion, the importance of which was illustrated in the early part of the report under the head "Fracture," where the particulars were given of the failure of an internally-fired boiler at one of the ring seams of rivets at the bottom of the outer shell, but which did not result in any injury either to life or surrounding property, neither was the boiler stirred from its seat, in consequence of the ends being firmly tied together by the longitudinal flue tubes; while a similar rupture in the plain cylindrical egg-ended boiler, without any longitudinal tie, leads to such explosions as that just reported."

The accident on Monday last is supposed to be traceable to external corrosion of the shell plates, where they came in contact with the mid-feather, on which the boiler rested. The plates had originally been ⅝ in. in thickness, but had become worn to less than 1-16th in. The rent commenced at about 6 ft. from the front end of the bottom at the shell; it ran round its circumference, and stripped off a length of about two plates in width. The rent also extended to the back end of the boiler, along the keel or centre line of the shell. It is the practice of steam-boiler associations to discountenance the flagging over of boilers; and the result of the inspections which Mr. FLETCHER has made shows the wisdom of the advice. External corrosion the Inspector has found in many cases during the month. In every case the boilers were covered with flags, which had not been removed for some years, but which were raised as soon as the boilers were placed under the care of the association. There had been no reason to suspect any corrosion, and the boilers were uncovered merely as a matter of precaution, All, however, were found to be attacked more or less with corrosion. To such an extent was this the case that the plates of one of the boilers had been reduced from their original thickness of 7-16th to ¼ in. in one place, and 3-16ths in another. It is recommended that instead of flagging boilers over they should be covered with an arched course of brickwork fitting the sweep of the shell. A layer either of felt, cork shavings, or other suitable non-conducting material being placed between the brickwork and plates. The covering should be neatly worked in round the fittings with "bull," or round-nosed, bricks, and finished off in the same way in front.

It should be admonitory to the owners of all steam-boilers that in no one of the accidents to which we have here referred was the boiler either assured or inspected by any of the associations which exist for those purposes.

MINING, METALS, AND MINERALS—PATENT MATTERS.

BY MICHAEL HENRY,
Patent Agent and Adviser, Memb. Soc. Arts, Assoc. Soc. Eng.

The year about to end has been of considerable interest to inventors, whose path of ingenuity lies in the direction of metallurgical mineral and mining arts; and this was also true of the previous year. Yet it may be observed, and, perhaps, with some degree of surprise, that though the whole number of patent applications in 1866, relating to the various useful arts, exceeded the number of the preceding year, yet the proportion of such applications relating to the particular subjects of metals, minerals, and mines was unquestionably less than that of very many previous years. This circumstance may be especially noticed, and it deserves comment. The number of patents in any particular branch of industry may, perhaps, be fairly regarded as an index of its healthful and progressive condition, and clearly offers a sort of barometric indication of the circumstance that such arts are receiving attention and consideration from the enterprising. The lists compiled for the "Inventors' Almanac" show that, though in 1865 the patent applications relating to metals and mining were 202, those of 1866 (just compiled) were only 157. In 1864 they had reached so high a number as 222. It is not yet possible to state what proportion these inventions will bear in the year about to conclude; but as the general number of British applications for Letters Patent is unquestionably, and not inconsiderably, greater in this current year, 1867, than the respective numbers for the two or three preceding years, it may fairly be presumed that the proportion bearing distinct reference to the special branches of industrial effort to which this article chiefly relates may be possibly increased in similar ratio. A retrospect of the year can scarcely fail to impress the minds of all reflecting men with a sad recollection that the number of fatal and terrible accidents occurring in mining operations in 1867 has been considerable and appalling. It is but too possible that many of these distressing incidents may be traced to indiscretion, and even recklessness; these are evils which no invention can remedy, and no patent can attain. But whenever the cause of mischief is attributable, as may sometimes be the case, to faulty apparatus, or defective mechanical contrivances, it becomes a serious question as to whether there be not grave personal responsibility. The very facts which form the essential features of machinery—that its material is inanimate, and its action controllable, facts which do not certainly reside in manual power—summon those who may be charged with the establishing, contriving, operation, and management of mechanism to apply their most earnest efforts to the selection of the best, and to the best administration of their selection.

The list of French patents for 1866 comprises a larger number of applications than did the lists of the two preceding years, and one may thence anticipate the possibility of a considerably larger increase for the current year, especially as the occurrence of the great French Exhibition may have probably afforded important impetus to the ingenuity of inventors, if we may form an estimate from the experiences of our own Exhibition of 1862. It may not, however, be out of place, even in this connection, to express a hope that, although the English Exhibition of articles and products relating to the metal industries was, as far as it went, creditable and valuable, yet it may be hoped that the world will not draw any inference from the brief list of exhibitors, and the comparatively small quantity of productions exhibited, as to the real numerical and intrinsic power and importance of English skill and invention applied in these productive industrial arts.

Let us all heartily, humbly, and prayerfully hope that the New Year, the coming of which we await, may be free from incidents of fatal accidents and fraught with industrial prosperity, and that all our contests at home and abroad may be restricted to the peaceful sphere of rivalry in the useful arts, by which nations are enriched and individuals benefited.

FRENCH IRON.—The total production of charcoal-made pig for 1867, in France, is estimated at 177,300 tons; of pig made with two combustibles, 78,700 tons; and of pig made with mineral combustible, 886,800 tons: showing a total of about 1,142,800 tons, of the value of 4,805,800*l*. In the year 1866, the production of charcoal-made pig attained a total of 213,000 tons, while that of pig made with two descriptions of combustible was 89,900 tons, and that of coke-made pig 950,200 tons: showing a total of 1,253,100 tons. The decline in the production of pig in France this year is thus estimated at 110,300 tons. The French production of charcoal-made iron this year is estimated at 41,700 tons; of iron made with two combustibles, 23,400 tons; and of coke-made iron, 735,900 tons: showing a total of 801,000 tons, of the value of 7,393,880*l*. If we compare these results with those for 1866, we find a diminution of 8700 tons in the quantity of charcoal-made iron, a diminution of 4700 tons in the quantity of iron made with two combustibles, and an increase of 2500 tons in that of coke-made iron.

DEPOLARISATION OF IRON SHIPS.—Mr. Evan H. Hopkins has recently been to the South of France, with reference to the invention of the late Mr. Evan Hopkins (his father), and operated upon one of the iron troop-ships of the Imperial Navy, with very satisfactory results. No doubt is entertained that eventually the utility of the discovery will be demonstrated, although, as is the case with every perfectly new invention, it takes a long time to get it introduced.

COAL IN NATAL.—The colonists are now exerting themselves in earnest to secure the development of the coal mines of South Africa and the provision of a coaling place for the Indian and Australian traffic. An influential meeting was held at Durban on Nov. 5, at which the opinion was freely expressed that coal mines exist in Natal of commercial value, and a resolution passed requesting the Government to procure 150 to 200 tons of approved coals from the mines at Newcastle for immediate transmission home, to convince the English people of the reality of this alleged resource. The Natal Land and Colonisation Society are using great exertions, and Mr. C. Behrens, their manager, is earning for himself a high reputation in the colony, and laying the best possible foundation for the permanent success of the enterprise with which he is connected.

UTILISATION OF COKE OVEN GASES.—The proposition to extract the volatile products from coal, and at the same time to obtain the coke in a commercially valuable form, was made nearly three years since by Mr. J. Nicholas, of Aspull, near Wigan, whose patent was referred to in the communication of Messrs. Jenkins and Rae, published in the Supplement to the Journal of Dec. 14. He proposed to employ an oven or retort with two apertures, each capable of being closed, leading to the condenser and to the air respectively. The oven is charged by a suitable door, and luted as usual, the heat being then raised sufficiently to distil over the products. To get hard coke instead of the usual soft coke, the aperture leading to the condenser is then closed and the other opened, the necessary draught holes, of course, being made to produce proper combustion, so that the coking can be finished in the usual manner. Owing to monetary pressure the inventor has been compelled to part with his interest in the patent, and Mr. J. P. O'Brien, Rock Ferry, Cheshire, has become the possessor. It is stated that the invention enables the manufacturer not only to gain in weight by the mode proposed, but also in proportion to the oil-yielding properties of the coal employed collect by condensation an amount of oil that would largely increase the coke producer's profits. It is considered that the value of such an invention can scarcely be estimated, particularly at a time like the present, when everything is tending towards a belief that eventually coal oil will be found praetically useful as a fuel for heating marine boilers. The great economy in stowage space and labour on board steamers, together with the rapidity with which steam can be generated, must necessarily recommend it to the notice of shipowners. Its applicability also for gas-making purposes, and other uses to which it is being applied, will materially make the production of coal oil a matter of great importance and interest to this country. The loss of considerable gas going to waste in the United Kingdom, according to our present rather primitive mode of coke making, is something enormous, being annually about 800,000 tons of coal oil, representing a money value of between two and three millions sterling, which may be collected, without injury to the coke, by the means provided in the specification. It is a subject well worth the attention of coke manufacturers, especially in districts where the coal employed is of an oil-yielding nature.

REPORT FROM SCOTLAND.

DEC. 25.—Since last week the Pig-Iron market has been flat, and a reduction of 1s. a ton has been established, owing to a desire on the part of holders to sell, and also to its having become known that the decrease in stocks this year will not exceed 40,000 tons, if it even comes up to that amount. The trade generally expected that the reduction of stocks would have reached 70,000 tons, and have been much disappointed by the estimate which has been made. Yesterday considerable sales took place at the reduced prices, 52s. cash, and 52s. 3d. a month, closing sellers at 52s. 1½d. cash, buyers over at 52s. To-day there is no market, being Christmas, but we understand that a meeting of the ironmasters will be held at the close of the week, when the largest makers of pigs, it is understood, will urge the necessity of still keeping the number of furnaces positively out of blast from being lighted till the consumption more closely approximates to the production—a course which, in a few months, would show its utility. The shipments for the week ended yesterday were very meagre, being only 5575 tons, against 13,865 tons same week in 1866, reducing the total increase in the shipments for the year till date to the small aggregate of 9500 tons, or thereby. No. 1, g.m.b., 53s.; No. 3, 55s.; Gartsherrie, No. 1, 60s. 6d.; Coltness, 59s.; Calder, 58s.; Glengarnock, 57s.; Carron, 57s. 6d.; Eglinton, 54s. 6d.

The demand is quieter for Merchant Iron, although some firms are fully employed, especially makers of ship and angle iron, for which there is a brisk enquiry, and higher prices are in some instances being given for this latter class of iron. Ironfounding is so much depressed in this city and neighbourhood that a reduction of 2s. per week is to come into operation here in January next, but there are fears that a strike may be the result of the notification. In Aberdeen we are informed that the dispute has been settled, and that the shops have been all opened again, but as there are only about 70 men to deal with altogether in Aberdeen, it must be evident that that number may be satisfactorily dealt with, when ten times that number may be found immoveable, and that is the difficulty here. The Glasgow employers very justly hold that for the men to refuse to work overtime when required is oppressive, as metal might be ready for casting just at the hour for stopping, and if not cast all the previous labour and casting would be lost, and so was a most impractible and unfair rule, along with others, which the employers would insist "must" be set aside.

The price of Coals, though weak, has not been reduced, but there is little doing, and as the sale coalmasters have to compete with the ironmasters, who are sending in their surplus to the market, the sales are being divided amongst a larger number of firms, which is making the paucity of the demand all the more keenly to be felt. The foreign shipments have been this week reduced to 7050 tons, but the coastwise are as high as 21,125 tons, which makes the two 28,175 tons, against 23,225 tons in the corresponding week, but the manufacturing consumpt in the city and vicinity is calculated not to exceed one-half of what it was at this period last year, and does not appear in the returns at all. The colliers are still agitating for a rise in wages, but are making little progress.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

A meeting of puddlers and millmen, called by handbills, was held at Wolverhampton on Monday. It was got up by Mr. Kane, and the object was to promote the union of the whole of the ironworkers of England, Wales, and Scotland into one great society. The attendance did not augur very well for the project. At the hour fixed scarcely more than a dozen persons were present, and the whole attendance before the close of the meeting did not exceed 70. The two speakers were Mr. Millington and Mr. Kane. The former indulged in very strong language, saying that Broadhead and Crooks were gentlemen compared with the ironmasters, and he denounced the opponents of a single Union, saying that the proposal—

"Was opposed by certain persons who sought place and power, and who were determined, at whatever cost, to hold a certain position and power; but he said that any man who dared to stand in the way of the formation of one Union was an enemy of the iron workers; and if an officer of the association stood in the way let them take him by the throat and put him out. The man who was such an obstacle was not only an enemy and a traitor, but he deserved the severest anathemas that the human tongue could utter. When they considered the state of semi-starvation in which they were, that of pauperism to which they would be reduced if they did not have a common Union, they would say with him tha tthe man who stood in the way of such a Union not only deserved to be branded as an enemy, but he deserved all that it was possible to give him."

Considering that the objects of these threats are simply men who think Trade Unions will work better than a national one, one is reminded how the tyranny of narrow-mindedness, which burnt martyrs at the stake for daring to think for themselves, still exists, and only needs "room and verge enough" to display itself in similar atrocity. He attacked the masters for not keeping their promises to the men to raise wages when iron advanced; then he ascribed the depression of the iron trade to the masters raising prices, in 1864, from 7*l*. 10s. to 10*l*. 10s. (it should have been in 1863 and 1864, from 7*l*. to 9*l*. 10s.), acknowledging, however, that "the wages were raised in proportion, according to contract," but not that the men, having previously got 6d. per ton above the agreement, got another 6d. in excess in that year. Mr. Kane also spoke in favour of a single Union, but was more moderate, and his arguments were not very cogent.

This being the last week of the present year, a glance at the Iron Trade of Staffordshire may not be uninteresting. The year opened with a reduction of 1*l*. per ton in the trade price of iron—bars 7*l*. 10s.; and wages were reduced in proportion, puddlers 1s. per ton to 8s. 6d., and millmen and furnacemen, thin coal miners, and others 10 per cent. These prices of iron and rates of wages were, however, higher than had prevailed for a long period. From June, 1861, to August, 1863, the trade price of bars was 7*l*. per ton. In that month it was raised to 7*l*. 10s., but wages were raised 1s. per ton, or 6d. more than the scale, and 10 per cent., making puddlers' wages 8s. 6d. per ton, as they had been previously reduced less by 6d. per ton than the old rule laid down for the regulation of wages by the price of iron would be required; thus giving puddlers an advantage of 1s. per ton, or 10 per cent. generally. In September of the same year a further advance of 1*l*. per ton on iron and 1s. on puddling took place, and in January, 1864, another 1*l*. and another 1s. were added, making bars 9*l*. 10s. and puddling 10s. per ton. This advance was, however, never realised, and in July of the same year iron was reduced 1*l*. It was not, however, until the end of the year that a reduction of wages in proportion was determined upon, and the long strike in North Staffordshire and the lock-out elsewhere ensued. At length 1s. was taken off puddlers' wages. In the beginning of the present year iron was reduced another 1*l*. per ton, making bars 7*l*. 10s., and wages were lowered in similar proportion, puddlers' wages being 8s. 6d. per ton. This is 1s. per ton above the rate of wages for more than two years previous to August, 1863, and it is likewise 1s. per ton above the regular long-established proportion between the price of iron and the rate of wages. The opposition which was made to the reduction of wages was very slight, however, and the Unions, which got the credit, without good reason, of the advances in 1863 and and 1864, fell into dispute, when it was seen that they were powerless to resist the reductions which ensued on trade declining. In opposition to a further reduction of wages at present, it has been urged at some of the men's meetings that the last reduction did not lead to a good trade. Suppose a farmer's wife were to say, "Well, I offered to sell my butter at 1s. less last week, and yet I brought some back from market; so this week I shall ask a full price;" would not she be regarded as insane? If ironmasters this year had adhered to the prices they hoped to sell at after the last reduction the ironworks of South Staffordshire would have been closed; and it is plain common sense that when demand is slack it must be stimulated by reduced prices. There is a price at which people would buy iron, and every approach to it increases the consumption.

It is satisfactory that the fears entertained of an advance in the

import duties in the United States in the beginning of the year have not been realised. The free trade party there could not get the present heavy duties reduced, but succeeded in crushing the confident hopes of those who were sanguine that a further augmentation would take place. India and the United States have been the main supports of the trade for the year, but the last quarter has been an excessively gloomy one, and the present is a very trying time for men and masters alike.

It is dangerous to attempt to indicate the prospects of the future. On the one side we have political clouds—France angry at failure, and at the successful rise of other powers around her, and ready to rise if but to vent her narrow jealousy. Fenianism is increasing our taxes and damping our confidence. The Abyssinian war, too, casts an uncertain shade over the future. Again, mercantile confidence is slow to recover. Railway finance seems to excite increasing suspicion, and the last disclosure in the case of the Midland Railway, although its prejudicial nature may be, and probably is, greatly exaggerated, checks recovery. People cease to trust one another, and trust is the very breath of commerce. Will this distrust abate? That is the main key to the future. On the other hand, there is a very great need for iron. The railways require relaying everywhere, especially in the United States; extensions have been long put off, and perhaps will be, yet many are really necessary; purchases of iron have been avoided, projects requiring it postponed, and stocks run down to a very low point. Hence there is a great need, but not yet an effective demand—that is, a demand with purchasing power. On the whole, any rapid recovery does not seem hopeful.

The managers and workpeople of the Parkfield Iron Company have presented Mr. Henry John Marten, C.E., with a highly embellished address on vellum, accompanied by a beautiful silver inkstand, value 43*l.* (manufactured by Messrs. Elkington and Co., of Birmingham), as a mark of their esteem.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

DEC. 26.—There has not been much business done so far during the week in North Derbyshire, the Christmas holidays interfering with all branches of the coal and iron, as well as other trades. There is no very great demand for Manufactured Iron, there being most doing in general castings. The furnaces continue in blast, although stocks generally are large, and a considerable tonnage of ironstone continues to be imported from Northamptonshire. There is a very good demand for Coal, both for house and gas-making purposes, and a heavy tonnage is being forwarded to London and the southern depôts, by which all the collieries are kept going. In the southern part of the county the colliers remain out, whilst the masters are fast filling up the places of the recusants. "Bull week," as that preceding Christmas-day is usually called, has been a very quiet one in Sheffield, although some few branches are tolerably well off for orders, including makers of locomotive and Bessemer steel. The proposed reduction in the wages of the iron-workers, has met with some opposition, and on Monday last the men at Parkgate held a meeting on the subject, but they were far from unanimous in opposing it. A deputation waited on Mr. Smith, the manager, and the matter was talked over. Mr. Smith, however, informed the men that the setting down of the works would be beneficial to the company. Such being the case, it is not expected that there will be any interruption to work. At Milton and Elsecar, where the notices have expired, it is expected matters will go on as usual, as any attempt to oppose the reduction would in all probability lead to the setting down of the works, and for which nearly all the hands are very badly prepared.

At several of the large establishments in South Yorkshire there is a fair amount of business being done, particularly in rails and plates, but at many of them large stocks of various qualities of iron are held. No material alteration can be noted in the demand for coal, which is of a moderate character for the season, that for steam purposes being very quiet indeed, so that at several of the collieries stacking to a considerable extent has had to be resorted to. The trade to London is not quite so active, but a very fair tonnage continues to be sent to Goole for the eastern ports, and also to the ironworks on the Lincolnshire side of the Trent. No alteration in the business doing in coke, which for some time past has continued steady, notwithstanding the fact that but little has been doing at several large ironworks in Leeds and other places for months past.

The prospects of the opening out of the Oaks Colliery are now more favourable than they have been since the occurrence. Up to Tuesday night the workmen were enabled to go as far as 40 yards on the south level, but they did not come across any of the bodies of those who have been so long entombed. They, however, reached one of the horses on Friday, and which had to be cut up before it could be sent to the top. The work is one of the most unpleasant that can well be conceived, still it is done cheerfully, and those engaged seem very desirous of recovering the bodies, with a view to interment.

The largest armour plate ever rolled is about to be tested by the War Office authorities, by the trial against it of some of the heaviest guns now in use. It was produced at the Atlas Works (Sir John Brown and Co.), Sheffield, and measures in its finished state 13 ft. 6 in. long by 3 ft. 5 in. wide, and 15 in. thick. The plate has been planed on the edges and ends, and presents a remarkably good and sound appearance; there is no indication of lamination, and it may consequently be considered that sound plates may be rolled up to almost any thickness.

REPORT FROM MONMOUTH AND SOUTH WALES.

DEC. 26.—It cannot be said that any improvement has taken place in the Iron Trade of this district during the past week, and the dulness which has characterised the various branches for so long a period has not in any way decreased. The trade at this season of the year is generally dull, but it is many years since that employers and employed witnessed such a Christmas as the present, more especially the latter, who have before them reduced wages, and only employment for about two-thirds of their time. How much longer such an unsatisfactory state of things is to continue is somewhat difficult at the present time to say, but it is generally believed the day is not far distant when a gradual improvement will set in. The home railway companies, owing to the want of public confidence in their securities, are still prevented from being large purchasers, but the general opinion is that the panic which has lately prevailed in railway securities and stocks will shortly expire. The stocks of the principal companies are exceedingly low, and it cannot be long before the companies are compelled to give out large orders. The efforts now being made in Russia to reduce the import duties on iron and steel are likely to prove successful, and should such be the case there is every reason to believe that the demand for iron from this district will be considerable during the ensuing season. In the early part of the new year there are a few clearances to be made to the United States, but enquiries from that country are not so numerous as anticipated. Several of the American houses have reduced their prices of iron, and it was said that this was done with the belief that a similar reduction would be made in this country; but even when the reduction of wages takes place there will be little margin left for makers' profits. Enquiries from the continental markets have not increased since last report, and so long as political affairs remain in an unsettled state the clearances to the continental markets will continue very limited. The latest advices from Australia convey the intelligence of the adoption by the Legislature of New South Wales of a Bill for a railway loan of 1,000,000*l.*, and it is hoped that some of the materials required will be obtained from this district. The notices given at the leading works for a reduction of wages will expire this day, but as a rule the men will offer no opposition to the proposed reduction, which it is supposed will be 10 per cent. on the present scale. For pig-iron, considering the present depressed state of every branch, there is a tolerably good demand, more especially for the best brands.

The Tin Plate Trade is dull, and quotations are not so firm as they were a fortnight ago, but an improvement is expected to take place at the commencement of the new quarter.

Steam Coal proprietors are well off for orders, and, as a rule, the collieries are fairly employed. The House Coal trade is dull, and shipments are below the corresponding period of last year.

The Golynos Ironworks were offered for sale by auction, at Newport, on Friday last, but, although the biddings were considered spirited, they did not come up to the reserved price, and none of the lots were disposed of.

It is rumoured that the Nant-y-Glo Ironworks are to be disposed of by Messrs. J. and C. Bailey. If the concern changes hands, the Bailey family, who have been connected with the iron trade of South Wales for several generations past, will be completely out of it.

Several of the colliers engaged at the late riot at Coedcae have been committed for trial, and it is to be hopes that such scenes of outrage and disturbance will never be again witnessed.

A case involving certain contracts entered into with Mr. Crawshay Bailey by Mr. Wickens, in reference to the Aberaman Works, was before Vice-Chancellor Malins on Saturday. The matter involved a bill seeking a return of the deposit, inasmuch as the contract with the company was not completed, and an arrangement that had been made between Mr. Crawshy Bailey and Mr. Wickens. His Honour, before whom the case had been argued, reserved his judgment, and he now said there was one point which had not been raised or argued—whether the bill being simply a bill for a return of the deposit was sustainable, and therefore the better way would be to have the case again on the paper in the Hilary Term, to be argued simply on that point.

[We are compelled to postpone our report of the proceedings at the South Wales Institute of Engineers annual meeting until next week.]

TELEGRAM (Friday Evening).—Five men have been suffocated today at the Bwllfa Colliery, Dare Valley, Aberdare, belonging to the Bwllfa Coal Company (Limited), in consequence of the wooden pipe used for ventilation having caught fire.

REPORT FROM NORTHUMBERLAND AND DURHAM.

DEC. 26.—The weather having moderated on the coast, numbers of ships have arrived in the various ports, and the collieries have been better kept at work lately, still at many of the works considerable stocks have accumulated, and consequently short time is still worked at some places. It is, however, likely that a change will take place for the better very shortly after the holidays are over. As the wages of the iron-workers have been reduced considerably during the year, there can be no obstacle to the making of contracts, as the masters here would now have a chance of competing with the ironmasters of other districts and other countries. A revival in the Iron Trade—that is, the manufacturing and general engine trade—is certainly very much wanted throughout the district, and it is hoped that this will shortly take place.

It is to be regretted that numbers of men continue to be brought up for leaving their employment at the collieries here, especially in Durham, and many of them so charged are engaged to a yearly hiring or agreement. What appears to have lately aggravated this intolerable nuisance is an impression which has got abroad among the men that, under the new Masters and Servants Act, those agreements are no longer binding. Of course, this rumour is perfectly incorrect and absurd, and the sooner the men are rightly informed respecting it the better. On Saturday, S. Westgarth and Henry May were brought before the Durham magistrates, charged with absenting themselves from the employment of Messrs. G. Elliott and Co., owners of the Sacriston Colliery. Mr. Brignal appeared for the prosecutor, and Mr. Patrick for one of the prisoners. The overman at the colliery proved the binding for twelve months' service. Mr. Brignal said they were the first cases tried under the new Masters and Servants Act, and he was sorry to say, in reference to the new law, that the workmen had got an impression that these agreements were not binding, and that they could leave their work when they liked. The prosecutors in this case did not press for punishment, but they wished the magistrates to impress upon the men that they could not leave their work at any time they liked. Mr. Fawcett pointed out that the effect of the new Masters and Servants Act was that the magistrates had the option of dealing with a prisoner charged under it in a variety of ways. The men then gave security for the damage sustained by the owners, and on promising to return to their work they were discharged. It is evident that too little is known of the new Act, and a few copies of it distributed to each of the ironworks and collieries of the district would prove extremely useful.

Mr. Thomas Horn, of Newcastle-on-Tyne, has patented an improved miners' safety-lamp. The lamp is said to be inexplosive, to give a light exceeding eight times that of the Davy, and to be self-extinguishing if accidentally overturned. The lamp has been submitted to eminent viewers, who approve of the construction, and it will, no doubt, be tested shortly at Hetton, under the superintendence of the Lamp Committee, appointed by the Northern Mining Institute.

IRON PYRITES.

BY DR. T. L. PHIPSON, F.C.S., ETC.

We do not agree with the French abbé who maintained that one of the greatest benefits we have derived from Divine Providence consisted in the fact that great rivers had been caused to flow past large towns, but we readily admit that Nature has been bountiful to Great Britain in distributing through that portion of the earth's crust occupied by these islands a great number of useful and otherwise interesting minerals, among which iron pyrites has become of late years a substance of considerable importance. This widely distributed and wonderful mineral possess very great interest, not only for the miner and the manufacturer, who owe so much to it directly, but for the historian, the antiquarian, the technologist, and others, to whom it affords numerous indirect benefits.

It is remarkable that so many learned writers who have treated of kindred subjects should have passed it by almost unnoticed. Even Beckmann, in his celebrated work on Inventions, Discoveries, and Origins, only alludes once or twice casually to pyrites. Again, we are astonished to find it frequently stated that the singular name of this stone of golden appearance was derived from the fact that it was formerly used in fire-arms; we notice with amazement the vexatious deceptions that occur year after year when pyrites disseminated through a quartz rock happens to be mistaken for gold, or, when in greenstone rock, for copper ore of valuable quality; we are struck by the obstinate manner in which the fragments of rolled pyrites found on our southern coasts still retain the singular epithet of "thunderbolts," and are picked up and preserved as *aerolites* by collectors of natural curiosities!

To the chemist and mineralogist there is, perhaps, no mineral that poesesses greater interest than iron pyrites, and although some superficial observers, who imagine that nothing can be valuable and interesting unless it be rare, may despise it as a common and worthless object of research, there lie still hidden in its composition and crystalline forms secrets which some of the most energetic minds of the eighteenth and nineteenth centuries have been unable to fathom. It has yet to be explained how it happens that the same substance occasionally presents itself in nature in two distinct forms, and possessed, in each case, of very different properties; and how certain minerals, more curious in this respect than others, have been, like this said pyrites, allowed by nature to show themselves in one-half of their normal geometrical figure, or *crystalline form*.

Iron pyrites is a compound of iron and sulphur, containing rather more than half its weight of the latter, the strict proportions in the pure mineral being 46·7 per cent. of iron and 53·3 of sulphur. Its physical aspect is so familiar, even to those who have only seen it glisten like polished brass in a lump of coal, that we may almost pass over its external appearance completely. Its brilliant golden colour has, indeed, often caused it to be mistaken for gold itself, especially where it penetrates quartz and greenstone rocks in thin filaments devoid of crystalline form. And even this, in inexperienced hands, would be a doubtful test, for when gold is found crystallised, which is sometimes the case, it is seen in crystals belonging to the same group or system as those of pyrites, and frequently not unlike the latter. Though very abundant in nature—or, rather, though widely disseminated over the globe and throughout its crust—iron pyrites is nowhere very plentiful in one spot. It is frequently met with in clay-slate, in greenstone, and in granular limestone; it is often seen dispersed through seams of coal, and is, in fact, to be met with in rocks and strata of almost every geological age, even in lignites, which are much more recent than coal, and in the more modern clays. It is found in masses, in veins, in nodules, in nests, dispersed through the rocks and strata, in stalactites, or in bright, well-defined crystals. Sometimes it forms the entire mass of a fossil ammonite, or a coal tree, whilst the external form of the fossil is preserved in a most perfect manner. Fossils of this description are by no means rare; they are of great weight, and when broken appear as if formed internally of massive brass.

The ancients were acquainted with iron pyrites, and Pliny knew that it is capable of emitting bright sparks when struck against some other substance as hard as itself. In speaking of the stone, he says "there is much *fire* in it," whence came the name *pyrites*, or *fire-stone*, derived from the Greek. Its hardness causes it to strike fire with a steel like flint; but there is an essential difference in this respect between flint and pyrites: when flint and steel are struck together smartly the sparks emitted are due to the minute particles of iron which are detached from the steel by the flint, as was proved many long years ago by Hawkesbee. The particles being excessively minute, and heated to an intense degree by the smart friction, take fire in the air, and burn vividly. If flint be struck against granite, for instance, no sparks are emitted. It is true that two pieces of quartz rubbed briskly together emit a *phosphorescent* glow, and the same occurs with sugar, and a number of other substances which become phosphorescent by friction. But the light emitted in these cases, like that of the glowworm or the firefly, is incapable of producing combustion. Now, when pyrites is struck against another hard stone, such as quartz or granite, sparks are emitted, just as if steel were used, the minute particles of pyrites struck off burn like the particles of steel, and will readily set fire to a dry combustible substance. This is, indeed, the principal source of fire among the Esquimaux of the Arctic regions. Around Proven and Upernavik, in Greenland—the northern limit of civilisation—they kindle the dry moss, and so light their smokey oil-lamps, by striking a lump of iron pyrites against a piece of hard granite.

One of the most interesting—or, rather, one of the most profitable—facts connected with the history of iron pyrites is that it often contains a notable proportion of gold. The existence of gold in it was known before the time of Robert Boyle, for he mentions the fact in the first volume of his *Works*; but the exact period at which this important discovery was made has never been accurately ascertained. At Macugnaga in Piedmont, in the neighbourhood of Freiberg in Saxony, and at Beresof in Siberia, the iron pyrites contains so much gold that it is worked expressly for the precious metal. The pyrites of several other regions has also been proved to be auriferous. In the old mines of the Leuchte, near Bergfreiheit, in Waldeck, which I visited in 1865, both the copper pyrites and the iron pyrites which accompany it contain gold: the quantity is exceedingly small, but between the years 1560 and 1572 most of the copper smelted on the spot was sold to Venice, where the gold was extracted.

In Piedmont the chief works for extracting gold from iron pyrites are at Macugnaga, at the foot of Monte Rosa: the mineral is found along the valley of Anzasca. The principal mines are at Pescheira and Minera di Soto, and the auriferous pyrites which is raised in these districts yields, it is said, only about 8 dwts. of gold per ton of ore, an incredibly small quantity. However, these mines have been long worked, and at one time employed no less than 1000 workmen, which could scarcely have happened unless the yield was greater than above stated. In fact, if such is true, English miners occasionally pass over pyrites which yields much more gold than the Piedmont ore. About the year 1844 those Italian workings were very actively carried on, for in that year alone the pyrites of the valley of Anzasca and its neighbourhood yielded about 20,000*l.* worth of gold.

According to Mr. Calvert, who wrote a book upon the Gold Rocks of Great Britain, and dedicated it to Prince Albert, there is a notable amount of gold in the iron pyrites of Keswick, in Cumberland. The same author asserts that in the Welsh mine Tydden Gwladus a level having been driven on to a lode containing lead and copper ore, with much iron pyrites, a sample of the lode in its rough state was submitted to analysis, and yielded only 1¼ dwt. of gold per ton, whilst the impure pyrites extracted from it yielded 1 oz. 12 dwts. of gold per ton. At Dolfrwynog, quartz with iron pyrites has yielded on analysis 6 ozs. of gold per ton, but pyrites in certain slate rocks has been known to have given as much as 130 ozs. An assay of some Cornish pyrites yielded 89 ozs. of gold per ton, but generally the quantity obtained is considerably smaller.

It sometimes happens that native gold and iron pyrites are found together in nature, causing us to suppose that they have been originally produced in similar circumstances. This was formerly very remarkable in the French mines at Gardette (Isere), where a quartz vein in gneiss was discovered about 1781, which was found to contain both iron pyrites and native gold.

Not unfrequently a specimen of iron pyrites in which no gold can be distinguished by the eye will yield to an expert chemist some 2 to 4 ozs. per ton of the precious metal. This is the case, for instance, with samples of Austrian pyrites, and probably with many others. Some specimens of French pyrites, examined by Prof. Pisani and myself in 1859, showed a similar result. We may condense these results into a very few words. When pyrites contains gold, which is not always the case, it is called *auriferous pyrites*, and the amount of gold yielded by this mineral rarely exceeds 1-5000th, or about 7 ozs. of gold per ton of ore. In addition to this portion of our subject, it may be stated that some other metals beside gold are occasionally found in iron pyrites. Thus the Portugese pyrites worked at Pomaron invariably contains a small quantity of copper, and the fact having become known is turned to account in England, as we shall see presently. Silver is rarely met with in iron pyrites, but its presence has been more than once carefully ascertained. The recently discovered metal *thallium* would, probably, have long passed unnoticed had it not been found among the volatile impurities given off by pyrites used for manufacturing sulphuric acid. In pyrites from Singapore I have found small quantities of *nickel*, the only time, I believe, that this metal has been met with under these circumstances. Another metal, *manganese*, is often present in pyrites, but only in very minute proportions, whilst *arsenic* is by no means an uncommon impurity, and hence this noxious element gets into the sulphuric acid made from pyrites, and into superphosphate manures made from it.

The connection of iron pyrites with fire-arms deserves to be briefly noticed. When Edward IV. landed at Ravenspur, in 1471, bringing with him 300 Flemings armed with guns, the latter were simply iron tubes with a touch-hole, mounted on a straight stock, and fired by means of a match. The accidents occasioned by carrying lighted matches near gunpowder very evidently caused some, now unknown, genius to imagine a method of producing fire when it was wanted only. Pyrites, or the "fire-stone," was the substance first tried. A piece of iron pyrites was fixed opposite to the open touch-hole, and when sparks were required it was rubbed with a file attached to the barrel. In the time of Henry VIII. a very ingenious contrivance was imagined by another forgotten genius, in order to get rid of the troublesome file. The latter was then replaced by a wheel and spring, coincident with the first appearance of a trigger. When the trigger was pulled the wheel, previously wound up by a key, spun round with great velocity in contact with the pyrites, and produced a regular stream of sparks. This was an important innovation, and appears to have answered the purpose tolerably, until some period in the reign of Charles II., when flint was hinted at as a substitute for pyrites. The flint lock is supposed to have been invented in the Netherlands; it was generally adopted about 1692, in the reign of William III., when all mention of iron pyrites for fire-arms had totally disappeared. In the year 1586, when a large deposit of pyrites was found near to Seefen, the Duke Julius of Brunswick caused it to be collected, and formed it himself into the necessary shape for the fire-arms of the period. In doing so, we are informed by Beckmann, the duke "often bruised his fingers, and was advised by his physicians not to expose himself to the sulphurous vapour emitted by that substance."

The great use to which iron pyrites is applied in the actual state of things is the manufacture of sulphuric acid. For this purpose upwards of 12,000 tons of iron pyrites are annually consumed by the alkali makers of Birmingham alone. A considerable amount of this is extracted from the coal strata of Staffordshire, and the adjacent counties, but the local supply is not equal to the demand, and large quantities of the important mineral raised in Cornwall, Ireland, Belgium (at Boom, &c.), Spain, and Portugal find their way each year to our midland manufacturies. The Portugal pyrites, which are raised in the neighbourhood of Pomaron, is preferred by many manufacturers, not so much on account of its high and uniform percentage of sulphur, but because this ore is known to contain a small proportion of copper, which renders the burnt residue, after the pyrites has been used for making sulphuric acid, saleable to the copper smelter. At Oldbury, near Birmingham, works have been recently erected for the purpose of treating this residue, and extracting its

copper. It would be well for manufacturers to have the pyrites they use tested now and then for copper and for gold.

Some 30 or 40 years ago all the sulphuric acid used in England was made from sulphur obtained principally in Sicily; and although several practical men had pointed to iron pyrites, which, as we have seen, is about one-half sulphur, as an abundant source of this element, little attention was at first paid to the important fact. How the innovation was brought about is graphically described by Dr. Ure. "Folly," says he, "achieved that which wisdom could not realise; and the infatuated cupidity of a Sicilian king compelled our manufacturers to lend a willing ear to the voice of science, and seek at home that which a prohibitive export duty prevented them from obtaining abroad." Though this duty was afterwards removed, the use of iron pyrites in the manufacture of sulphuric acid was too firmly established ever to be relinquished. Not only is the mineral largely employed at the present time, but means have been adopted in many works to separate the arsenical compounds from the acid thus produced, which, in other respects, is identical with that obtained from Sicilian sulphur.

Iron pyrites may also be made to produce sulphur itself; this occurs when it is heated in closed retorts. Under these circumstances the mineral loses only about 20 per cent. of sulphur, which distils; the rest remains combined with the iron. Now, if at this stage vapour of water is passed over the residue, the remainder of the sulphur is eliminated as sulphuretted hydrogen, a discovery due to M. Charles Mène, which may some day be turned to account. But the distillation of pyrites or sulphur appears to have been almost entirely abandoned. On the contrary, when pyrites is burnt in contact with the air the *whole* of its sulphur is expelled as sulphurous acid, which goes into the leaden chambers, and in contact with nitrous vapour becomes sulphuric acid, the most important chemical product of the present day; the quantity of which consumed by any nation measures directly the degree of civilisation which that nation has attained.

If it is pleasant to contemplate this common, and by many despised, mineral in its several useful aspects, we cannot overlook the fact that it sometimes proves extremely noxious to mankind. This is the case, for instance, in certain copper mines, where the *cupriferous* lode becomes more and more *ferruginous* by the introduction of iron pyrites, and finally ceases to yield a profitable amount of copper, the copper pyrites having disappeared almost completely, and being replaced by the far less valuable iron pyrites. Examples of this are seen in some of our Cornish lodes, and in many of the German mines, especially in the Hartz district and its neighbourhood. Again, there is a particular kind of pyrites which decomposes easily in damp air, and this change occurring in our coal mines, is accompanied by so much heat that the mine is fired, causing serious destruction of property, and sometime great loss of life. At Aveyron, in the South of France, there is a mountain which has been on fire for centuries in this manner; and though the inhabitants of the neighbourhood recently caused the little rivulets of the district to flow into this *quasi* artificial volcano, they only increased the combustion thereby.

But this very action which, in particular cases, is so prejudicial, in others is rendered useful for the manufacture of alum and green vitriol. The pyrites which decomposes thus in contact with schists or clay, occasions the formation of sulphate of alumina, an essential ingredient of alum; and when exposed by itself to the air and the damp, this particular kind of pyrites gradually becomes green vitriol, or sulphate of iron.

This leads us to a fact of much importance, whether it be regarded in a purely scientific light, or merely from a practical point of view —namely, the existence in nature of two kinds of iron pyrites, the one crystallised in cubes, and called "cubic pyrites," the other showing itself in prisms, and termed "prismatic pyrites." The chemical composition of these two substances is identical, nevertheless they differ not only in crystalline form, but in specific gravity, colour, durability, and many other properties. The cubic pyrites is usually bright, and resembles polished brass of the finest quality; it is not affected by long exposure to the atmosphere. The prismatic pyrites is much paler, sometimes nearly white, much duller, and is so easily acted upon by damp air that it is impossible to keep it for any length of time in our mineralogical collections. It is this latter variety that plays so important a part in the production of alum. There is a third variety also, much less common, which has been termed "magnetic pyrites," because it is attracted by a magnet; when abundant, as in some parts of Germany, it is used like the more common sorts, from which it differs somewhat in composition.

The cause of the existence of the two varieties we have just termed "cubic" and "prismatic" pyrites is a problem which has never been solved. Some have supposed that the former was originally formed under the influence of fire, as it occurs abundantly in certain so-called *igneous* rocks, such as greenstone, and in the clay-slate which is upheaved by them; whilst the prismatic variety is most abundant in more modern clays, and often accompanies lignites, whence it was supposed to have been formed by the agency of water. This theory is not quite satisfactory, since *both* varieties are found in our coal strata. Samples of a new seam of coal discovered in South Wales, which were lately sent to me for analysis, displayed on being broken both cubic pyrites in perfect crystals and streaks of prismatic pyrites, which were not many days in giving signs of rapid decomposition, and soon fell to powder under the influence of the atmosphere.

If cubic pyrites had been as easily desintegrated as the other variety it could not have been so frequently used in jewels as an ornamental stone, or made into mirrors by the ancient Peruvians. Strange as it may seem in the present day, cubic pyrites, not many years ago, was extensively used in jewellery, and cut as an ornamental stone, under the name of *marcassite*. Only a short time ago I saw some of these pyrites jewels, buckles, brooches, rings, &c., in the shops of the Palais Royal, at Paris, and they certainly produced a very pleasing effect. Viewed from a little distance well-cut pyrites shines like a diamond, though it is a yellow and opaque stone. But this property of iron pyrites has been known for ages. Both the Greeks and the Romans cut pyrites as an ornamental stone; the art seems to have ceased for a time, but was renewed in the middle ages, and even at the present day a marcassite jewel may be occasionally met with in Europe. It was the introduction, some years ago, of steel ornaments which did away with the cutting of pyrites. The French workmen think that the ancient art of polishing marcassite has been lost; this idea may have arisen from the fact that they usually cut the pyrites found in the slates of Angers, which is of a pale, whitish yellow; whereas, it was most probably the bright mineral of the island of Elba which was chiefly employed by the Romans.

The ancient Peruvians made great use of pyrites as an ornament, and from the fact of its having been thus patronised by the Incas, or princes of Peru, came the denomination of *Incas stone*, which we find in several old authors. Beckmann alludes to it as having been one of the substances used by the native Americans to form mirrors "before they had the misfortune to become acquainted with Europeans."

According to the distinguished Ulloa, the *Incas stone* was brittle and opaque; it had often veins which could not be polished, and caused it to break where they occurred. The mirrors made of it which he saw were small, they varied from 2 to 3 in. in diameter, but he mentions one which was about 1½ ft. wide. Wallerius, and other mineralogists, assert that the Incas stone, which was afterwards proved to be merely polished pyrites, was brought to Europe and worn in rings under the name of "the Stone of Health"—why it received such a curious appellation was probably best known to those who sold it. The last circumstance connected with iron pyrites to which I shall allude here relates to those curious nodules of radiated pyrites which are washed from the cliffs of our southern coasts, and rolling for some time on the beach become covered with a layer of brown oxide of iron, which protects them, more or less, completely from the action of the air. These nodules, which are generally somewhat cylindrical, are occasionally picked up as great curiosities, and amateurs denominate them "thunderbolts." I have met many otherwise well-informed persons who have assurred me gravely that these stones had fallen from the skies. The fact has been twice alluded to in my recent work on Meteors, and I will only stay here to explain how such a singular opinion appears to have originated. Many years ago, when the celebrated chemist Lavoisier was requested to examine and report upon a meteoric stone, or *aerolite*, which had fallen shortly before in France, with the usual impressive phenomena that accompany a fall of meteoric stones, he did not give it that careful attention which he usually bestowed upon scientific observation. Probably not believing all the accounts which he had heard of the marvellous occurrence, he hastily pronounced the stone to be a piece of iron pyrites, apparently burnt by the action of lightning. The opinion of so distinguished a philosopher was not long in spreading through every grade of society. Each one interpreted it according to his own idea, and for the majority it was an established fact that from time to time iron pyrites came down from the heavens in flashes of lightning.

A circumstance which may have helped to give vitality to this error was the discovery in real aerolites of small quantities of magnetic pyrites, which is invariably present in meteoric stones, where it accompanies another substance similar in appearance, called "Schreibersite." The latter is extremely interesting on many accounts, but more particularly so from its never having been discovered among the minerals of our earth.—*London.*

MINES, BANKS, AND RAILWAYS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—We must, or should, all necessarily reflect at times upon the consequences of commercial and monetary epochs, such, for instance, as we have passed through from June, 1865, to Dec., 1867, a period over two years. During this interval we have had exhibited every phase of excitement and depression. The fall of the Messrs. Overend, Gurney, and Co. (Limited) struck terror and dismay throughout the monied circles of Europe; whilst that of Messrs. Peto and Co. astounded not only the contracting public, but stopped the works of gigantic undertakings, rendering railways bankrupt, and in their fall collapsing not only banks and discount companies, but shaking to its very foundation the strength and solidity of our first and most important financial institutions. The sad reverses and disasters traceable in every direction from the rapid and continuous retrocession in value of property, cannot otherwise than expand the views, and enlighten the minds of all, grasping cause and effect inseperable from a panic such as we are now emerging from. The crippled resources and restricted trade, at home and in our colonies, have, happily, reduced our commitments to a healthy standard of supply and demand. We can now breathe a hearty and wholesome respiration, and, without dejection, look to the future with cheerful and aspiring hopes of continuous successful trading. We, of course, like the greater number of our fellow-citizens, have not escaped the scourge, nor are we likely to forget the effects, both to us and most of our acquaintance, whether rich or poor, scattered throughout the length and breadth of the land. The late and continued monetary reverses unquestionably arose from the mistaken views and policies of banking and finance companies, called into being under the fascinating, though deceptive, smiles and attractions of the "Limited Liability Act," assisted by the false impetus of worn out and exhausted firms, of traditionary yet fallacious wealth, added to creations of scheming and speculative promoters. The easy belief of the subscribing shareholders was only equalled by the greed of the exacting directors.

The first lesson to be gleaned from the results of the past five years is the "certainty" that a man should not "kick against the pricks." He should most unquestionably, if he desire to make money, take advantage of every new feature that is favoured with public notice: he should mark the growing force that springs from popular feeling, receive and remember the increasing intelligence communicated by the daily press, and cherish the knowledge of a growing resolve, whenever perceptable, on the part of the people to have a voice in the direction of their own affairs, whether it be for good or bad, and which at this moment is as easily discernable and detected in the tone and continued stagnation of the money markets of the world as it was rampant and universal three years ago, when the veriest dolt could sell a scheme at the price of a reality, and a questionable financier of the day create and establish the greatest of enterprises, whether it be considered in the sense of a contracting, banking, or discount institution; therefore, experience has taught us that success can only be achieved through entering boldly and without hesitation into the full stream of the people's choice, and swimming onward, without fear, in the volume of the current. It is utterly futile to oppose the sway of public opinion, and lose ourselves in the vain attempt to acquire single-handed that which the masses have determined otherwise. We must admit, however, that free trade is firmly established, and that it has become identified with every branch of our national policies. It is indissolubly interwoven with our institutions, whether political, commercial, or social, and affects not only our domestic conduct and prosperity at home, but likewise our practises and relations abroad. Indeed, it is difficult to overrate the importance of free trade to the Mother Country, as influencing and elevating the tone and character of her people in their varied intercourse and manipulations throughout the civilised world.

As regards the mining pursuits of the country, compared with other industrial interests, both at home and abroad, we must confess that we see no cause for morbid apprehensions as to the future, although we must admit that losses and depreciations have been encountered in mining enterprises like those experienced in railway, banking, finance, building, shipping, and other speculative undertakings, all of which have more or less suffered from the reaction (protracted over a period of three years) of overwrought inflation, intensified from reckless gambling in hazardous adventures raised to fictitious values for a period of five years antecedent. It is now just six years ago (on August 17, 1861) when your columns teemed with universal complaints of the low prices of metals and minerals, and the hardships and trials endured by the hardworking, still enduring miner. No dissatisfied farmer, whether it "shone or rained," could vent his spleen in more vapid and phlegmatic peevishness than did the Cornish shareholder in mines "then in the receipt of good and substantial dividends," or his labourers who were paid 20s. to 25s. per week wages for five days of eight to ten hours each. The Dolcoath Mine, at that period, declared dividends of 7*l.* per share two monthly, say 42*l.*, or 12 per cent. annually, on 350*l.*, the market price of shares. At that date the price of metallic tin was 114*l.* to 116*l.* per ton, against 97*l.* to 99*l.* at the present time—a fall of 17*l.* per ton, or about 15 per cent., having transpired in the interim, yet we are informed by you that this mining company, with peculiar significance, had resolved upon stacking one moiety of their produce, and which for the months of May and June, 1861, amounted to no less a sum than 11,177*l.* 15s. 7d. Had this absurd resolution been carried out no possible profits could have accrued to the shareholders during the whole period elapsing. In the face of this falling off in the price of tin of 15 per cent., let us enquire into the present position of Dolcoath Mine, and we shall learn that it still pays 3*l.* per share two-monthly, and continues to be greatly productive, and little doubt can be entertained that with the revival of trade and commerce better prices for the yield will be obtained, whilst labour and supplies of materials and machinery will long continue reduced in prices, and from increased competition the supply in all likelihood will be improved in quality. We may further observe that the same spirit of discontent is still being manifested as existed six years ago, when individual and public enterprise were alive, and *color de rose* ruled triumphant—*i. e.*, in exact juxtaposition to the tone and character of enterprise, trade, and commerce of the present day, which lies prostrate from the retrocession consequent on feverish inflation counteracted by the severest purgatives. This bright picture of Cornish successful mining stands equal in brilliancy with the Devon Great Consols, each mine having returned about 4,000,000*l.*, and afforded gains of about 1,000,000*l.* sterling. The Devon Great Consols sold for 350*l.* per share six years ago, against 430*l.* at the present time; the dividends were 7*l.* per share in 1861, and they are 7*l.* per share now two monthly; the aggregate dividends for the six years amount to 307*l.*, or equal to 51*l.* 3s. 4d. annually. The produce of the mines is copper, which sold in August, 1861, at 96*l.* per ton, against 77*l.* at the present time; thus in the face of a depreciation of 14½ per cent. in the price of metallic copper, the Devon Great Consols yields the same dividends now as six years ago, whilst the works, we are advised, show no signs of ever approaching exhaustion. The mines now upon the tapis, unrecognised six years ago, are the West Chiverton, Prince of Wales, Great Laxey (having declared dividends of 142,000*l.* on 2000*l.* outlay) required further outlay, which resulted in brilliant success. Great Wheal Vor had declared her maiden dividend of 5s. per share, and the price stood at 6*l.* each; now the most profitable tin mine in Cornwall. South Caradon dividends, in face of depreciated prices of copper, have advanced from 5*l.* to 6*l.* per share, two-monthly, and the price of shares from 300*l.* to 400*l.* per 512th; the aggregate dividends on this property are 568*l.* 10s., against outlay 1*l.* 5s. per share. The lead mines of South Wales continue to pay well, especially the Cwm Erfin, Cwmystwith, and Lisburne. The Bwlch Consols and one or two others present most encouraging prospects. Foxdale, in the Isle of Man, Minera, near Wrexham, Herodsfoot, in Cornwall, Summer Hill, near Mold, and the Derwent Mines, in Durham, are striking examples of profitable lead mining. As regards other mines most worthy of note we would enumerate the South Crofty, Rosewall Hill and Ransom, Chiverton Moor, Great Cwmsymlog, South Condurrow, and West Tolgus.

Joint-stock banks have encountered severe and united attacks on their strength and stability, but firm as rocks the London and Westminster, London Joint-Stock, Union of London, with others in the metropolis and the provinces, have withstood the shock, and stand now in bold relief as institutions of vigorous growth, worthy the continued confidence both of shareholders and depositors. These are favourable instances of unlimited liability companies, so far as commitments to customers go, but limited as betwixt the shareholders themselves to the amount of capital subscribed. There are other great advantages associated with these undertakings which add solidity and firmness to the future—the additional share capital, created and issued at premiums, that not only increase the power and resources of several companies, but add greatly to the large reserve funds at their disposal to meet future contingencies or disasters. In respect to banking companies constituted upon the limited liability principle, we regret to add that we cannot advance much in their favour; they are at most trading and discount companies. Banking requires unlimited trust, and unlimited responsibility; the depositor requires his money at call, and without the fear of risks: in a limited trading company unbounded confidence cannot exist. Hence, whenever commercial pressure arises they must be severely tested, and, in our opinion, it is only a question of time and leverage for the best to have to succumb. In conclusion, an important feature as regards every description of joint-stock banking company is, in our opinion, the legislative measures in respect to dealing with shares in the market for sale. The fact of rendering every transaction in shares illegal excepting the numbers are inserted in the contract note, is at one fell swoop to crush all speculative operations—thus, future purchases and sales will become solely of a *bona fide* character. At first sight, this may to many appear desirable, and to others of no moment; but we apprehend that the time is not far distant when the sale of shares will become a matter of negociation, and require time to be effected, as in the case of a house or a horse. If so, the commercial value of shares cannot but gradually recede, and instead of selling at ruling quotations premiums will greatly diminish, and in instances discounts will probably prevail.

We regard the changes and enactments of the past session of Parliament, as affecting railway companies and railway securities, as steps in the right direction, and calculated to inspire confidence in the soundness of the vast interests involved. The mistrust so generally entertained has become greatly appeased from the disclosures made and the legislative measures so promptly adopted to afford relief to insolvent undertakings. It is true that the worst aspect of affairs may not yet be known, but the investigations instituted, and the earnestness of executives to explain away apparent difficulties, tend greatly to dissipate mistrust, and to disarm alarmists; hence the sad reverses experienced during the recent monetary pressure in banking securities, through the circulation of unfounded rumours will, it is to be hoped, in the case of railways prove inoperative, and of little consequence or effect, otherwise than is already encountered. The pre-preference issue would have proved a sad misfortune, had Parliament sanctioned such a measure. Faith in the integrity of commercial engagements would have been shaken to its very foundation, and far better will it prove for debenture and preference stockholders to allow their dividends to remain in abeyance, and accumulate, in case of necessity, over a period of years, than that the acts of directors, or the sacred resolutions of legally constituted meetings, should become negatived and void through legislative interference. However stern and imperative may be the engagements entered into, or hazards presented through crippled resources available for the requirements of particular or individual lines, consistency should be preserved, for nothing is calculated so effectually to bring an undertaking to grief as the slightest approach to repudiation. In the Mother Country, as well as in our more important and affluent colonies, faith should and is held to be inviolate, and the most pregnant signs of advancing civilisation, added to permanent and *bona fide* growth of wealth, are discernible wherever it is held in greatest respect and force. This tenacity of honour and conduct does not interfere or interrupt the natural and enduring desire and ambition to advance, or debar in cases of progress or changes the power to annul and to reform whenever necessity requires legislative interference, rather than blindly to adhere to old laws, imperfect administration, or their inefficient application when called into practical use. It is true that we preserve a due respect and reverence for the wisdom of our ancestors, but we do not in any respect rest satisfied with their crude enactments, or follow in their paths without striving to approach as nigh as possible to the advancing requirements of the age; ever fostering and protecting, yet still adding and improving; guarding with vigilant and jealous care, yet pruning and enlarging whenever circumstances require amendment. Thus we preserve in its active growth and consistency the true and enlightened social and commercial standard of the British empire, keeping apace with the liveliest and happiest degree of civilisation ever attained either at home or abroad. Returning, however, to railways, we cannot but apprehend further distresses, although of a modified and less alarming character than those already revealed. It must be admitted that English railways and railway securities are in a very lamentable and deplorable position, requiring time and money, and good management, to redress past neglects and abuses. The lessons already instilled into the minds of directors and officials ought, and should, effect great good; they should command increased vigilance and supervision, retrench expenditure, and conduce to economy. Capital stock should be closed, and new branches abandoned, and those in course of construction restricted in their growth and exactions on the mother purse so far as practicable; then with prudence and judicious foresight as regards the future, we believe the chief lines of the kingdom possess an inherent worth and spring within themselves that will soon reanimate the waning confidence of the timid, and gather fresh strength and power from the emprise and industry of the community. The iron roads of England are national undertakings, and as essential to its welfare and greatness as its commerce or agriculture. We could not maintain ourselves in the exhalted scale of nations that we now command but for our railways, and our mines of metals and minerals, nor could we conduct the commerce of the country without our thoroughfares and our mineral productions. Hence all that we have to encounter to ensure prospective and permanent success is patience, judicious retrenchment of new branches, and practical control maintained by directors and executives in the development of existing and latent resources, coupled with economy in the working expenses, and lessened extravagance in the collection of revenue; added to these fewer employees, and cessation of needless competition with neighbouring lines: but, above all, save us from the like disasters encountered by the North British, London, Chatham, and Dover, London, Brighton, and South Coast, and the Great Eastern. The falling off in dividends of the Great Western, Glasgow and South-Western, Caledonian, with others that of late have caused discussion in well-informed circles, appears to us to have strengthened rather than diminished confidence in the future, as it clearly establishes the hypothesis that directors and shareholders are alive to their own interests, and should they cheerfully submit to immediate sacrifices rather than bolster up their property through paying fictitious dividends, great will prove the prospective advantages.

INVESTIGATOR.

TO CAPITALISTS SEEKING A FIRST-CLASS INVESTMENT.

£5 per cent. per annum, free of income tax, with a prospective increase to £7 per cent. per annum.

CAPITAL, £1,750,000, AND UPWARDS.

THE HULL DOCK COMPANY,

Incorporated by Act of Parliament, 1774,

Sole proprietors of the Docks at Hull, the third port in the kingdom, are now issuing the remainder of the share capital authorised by recent Acts of Parliament. These shares are guaranteed to pay a dividend of £5 per cent., free of income tax, until one year after the opening of the Western Dock, and are limited to pay a maximum dividend of £7 per cent. in terms of the Company's Act of 1861. The new shares rank equally with the existing shares of the company, and there are no preference shares. The tonnage of the port is rapidly increasing, and in the year 1866 amounted to 1,343,819 tons.

The Dock Estate consists of the six docks at Hull, with large and commodious warehouses, offices, &c., adjacent to the docks, and the company possess large unincumbered house and other property, which, in addition to the rates and dues payable to the company, produce upwards of £14,000 a year. The reserve fund of the company available against contingencies is upwards of £65,000. The Western Dock, now in course of construction, is expected to be completed in the year 1868. The North-Eastern Railway Company hold £50,000 of the share capital of the company, and the Trinity House of Hull £30,000. The Lancashire and Yorkshire Railway Company are seeking parliamentary powers in the session 1867-8 to enable them to subscribe to the shares of the Dock Company. The loan capital has been raised at rates averaging under £4 12s. per cent. The shares are £50 shares, the calls on which may be made by periodical payments extending over several years, or in one or more sums, at the option of subscribers.

Applications for shares and for detailed particulars of the financial position of the company may be made to GEORGE W. DUMBELL, Secretary.

Dock Office, Hull, November 18, 1867.

IMPROVED APPLICATION OF WATER POWER.

THE TURBINE.

MAC ADAM BROTHERS AND CO., ENGINEERS, SOHO FOUNDRY, BELFAST, after twenty years of experience, have brought their IMPROVED TURBINE to great perfection.

It is applicable to all practicable heights of fall, giving much greater power from the water than any other kind of water-wheel.

On low falls it has the great advantage of not being impeded by floods or backwater.

It is particularly well adapted for situations where the quantity of water is variable, and where all other wheels fail.

Its motion is extremely regular, and, when desired, a governor can be applied effectively.

This wheel is at work in a great many places, to which reference will be given.

HUNT'S PATENT ORE-SEPARATOR, AND GOLD-WASHING MACHINE.

THIS MACHINE, with the latest improvements, will be found WELL WORTHY of the NOTICE of ALL CONNECTED with MINING MATTERS, both as to its effectual working and cheapness, the licence from the 1st of December being considerably reduced.

Testimonials of the highest character, and all other information, can be obtained from Mr. JOHN HUNT, Porthleven, Helston, Cornwall; or of the manufacturers, Messrs. HARVEY and Co., Hayle, Cornwall.

N.B.—A Working Model of the Machine can be seen at the South Kensington Museum for Patents.

WILSON'S PATENT SMOKELESS FURNACE

LICENSEES AND SOLE MANUFACTURERS

HICK, HARGREAVES, AND CO., SOHO IRONWORKS, BOLTON.

These furnaces are now in full operation, and are giving most satisfactory results, both as regards economy in fuel, complete consumption of smoke, and small wear and tear of furnace. They may be seen in daily operation at these works.

COMPRESSED FUEL

(BIRD'S PROCESS)

CAN BE MADE EVEN BY HAND-PRESS LABOUR AT THE PIT'S MOUTH, or at any WHARF or YARD where COAL or COKE DUST is obtainable.

The loss of dust by frequent transport, waste of "smalls" from falling unconsumed between the furnace-bars, or being driven up the chimney by the draught, and consequent choking up of flues, is diminished by this process.

The foreign matter in admixture being but one-half per cent. to the ton, and of a nature to ensure perfect combustion, the coal or coke treated remains unspoilt.

Drying is very rapid, and no artificial system needed.

Gluten, cement, and all ingredients needed for mixing can be supplied in bags as required. License fee, £10; royalty, 3d. per ton.

Apply to— JAMES BIRD,

No. 2, LAURENCE POUNTNEY HILL, CITY, LONDON.

UTILISATION OF COAL DUST AND MANUFACTURE OF ARTIFICIAL FUEL.

BARKER'S PATENTS.

THE LONDON PATENT COAL COMPANY (LIMITED) having purchased the sole rights to these patents throughout the United Kingdom, are now granting licences to coal owners and others for the use of the invention.

The process is simple and inexpensive; the cost of manufacture, including the amalgamating material, being only 2s. per ton.

The fuel is without smell, and is available for all the uses of ordinary coal. It occupies 33 cubic feet of space per ton only, as against 42, the Admiralty measurement for coal. In the various tests it has undergone it has in every instance beaten similar round coal in evaporative power, weight for weight.

For particulars of these trials, and every information respecting the patents, apply to the Managing Director, or the Secretary, 26, Martin's-lane, Cannon-street, London, E.C.

PATENT IMPROVED PICKS,

FOR COLLIERS AND MINERS.

MADE OF WROUGHT IRON, YELLOW METAL, AND MALLEABLE CAST-IRON.

For terms and information, apply to the patentees,—

F. W. DAHNE, C.E., and Manager of Messrs. Vivian and Sons' Spelter Works, Swansea; or

DAVID THOMAS, Mineral Agent, Cwm Avon Works, Taibach.

WROUGHT-IRON TANKS, CISTERNS, GIRDERS, FUNNELS, &c., Plain or Galvanised.

CATTLE TROUGHS, IRON CART BODIES, &c., GALVANISED OR LEAD SERVICE PIPE, BRASS BALL VALVES, &c.

Merchants and Shippers supplied at the usual discount.

HENRY WATSON AND Co.,

No. 60, VAUXHALL STREET, LAMBETH, LONDON.

PIG LEAD.

MESSRS. WESTON AND COLLINGBORN SOLICIT ORDERS for SOFT PIG LEAD, which they are producing of the very best quality

Prices on application.

WORKS,—SWINFORD, GLOUCESTERSHIRE.

OFFICE,—18, PETER STREET, BRISTOL.

GREEN SLATES.

GREEN SLATES OF ANY SIZE, and of the CHOICEST COLOUR and QUALITY, can now be OBTAINED from the DOROTHEA WEST SLATE COMPANY (LIMITED), CARNARVON.

The "CHARING CROSS HOTEL," "STAR AND GARTER HOTEL" (Richmond) "LONDON-BRIDGE HOTEL," and many other public buildings, are covered with these elegant slates.

Orders will be executed in regular succession.

Apply to Mr. THOMAS HARVEY, General Manager, 9, Segontium-terrace, Carnarvon, or 33, King-street, Cheapside, London.

THE GOLD MINES OF NOVA SCOTIA.—Mr. HEATHERINGTON, whose Statistical Reviews of the Gold Mines have been adopted by the Provincial Government and the Paris Exhibition Committee, and were favourably noticed by the *London Mining Journal*, is PREPARED to SECURE, VISIT, and REPORT upon MINING PROPERTIES in NOVA SCOTIA for investors who reside abroad.

Address, A. HEATHERINGTON, box 266, General Post Office, or Somerset House, Prince-street, Halifax, Nova Scotia.

GOLD MINING IN NOVA SCOTIA.—CAPTAIN J. ROBERTS, who has been VISITING the MINES of NOVA SCOTIA the last two months, has come to the conclusion that, with judicious management, Nova Scotia Gold Mines can be made to pay handsome dividends—by the erection of machinery and good discipline, like he was accustomed to in Gongo Soco and St. John del Rey; but Captain Roberts deeply regrets to find that some of his countrymen who came out here got in such disrepute by their reckless mismanagement of the Nova Scotia Gold and Land Company's property, as to leave very little confidence in their ability as mining men, and which, it is well known, they cannot do without. Capt. Roberts has seen more visible gold in the veins here than in any country he has been into.

Mansion House, Halifax, Dec. 4, 1867.

ROBERT LIBBY AND SON

MINE AND SHAREDEALERS, &c.,

CAMBORNE, CORNWALL.

In the Court of the Vice-Warden of the Stannaries.

Stannaries of Devon.

IN RE MONKSTONE CONSOLS MINE.

TO BE SOLD, pursuant to an Order made in a Cause of Horswill *v.* Chenhall and Others, and dated the 31st day of October last, BY PUBLIC AUCTION, at the Registrar's Office, in Truro, on Wednesday, the 8th day of January next, at Twelve o'clock at noon,

680 (4096th) SHARES of the defendant, William Chenhall,
512 (4096th) SHARES of the defendant, James Warne Chenhall; and
512 (4096th) SHARES of the defendant, William Shillabeer,

Of and in the said MINE. J. G. CHILCOTT, Truro

(Agent for E. Chilcott; Plaintiff's Solicitor, Tavistock).

Dated Registrar's Office, Truro, Dec. 24, 1867.

In the Court of the Vice-Warden of the Stannaries.

Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACT, 1862, and of the WHEAL WILLIAM MINING COMPANY.—TO BE SOLD, under the direction of the Registrar of the said Court, BY PUBLIC AUCTION, on Tuesday, the 7th day of January next, at Twelve o'clock at noon, at the Prince of Wales Inn, Lanlivet, within the said Stannaries, in lots, the MINE SETT or GRANT, and the

MACHINERY, MATERIALS, and other EFFECTS

At WHEAL WILLIAM MINE, near Locking Gate, in parish of Luxulyan, viz.:

ONE 22 in. cylinder STEAM ENGINE, 6 ft. stroke, and fly wheel.

ONE BOILER 8 tons; 16 head iron stamps; axle, with 15 heads; round buddle gear and launders; new stamps; guides, heads, &c.; 6 9 ft. 11 in. pumps; 1 11 ft. 10 in. working barrel; 1 5 ft. 10 in. doorpiece and door; 1 9 ft. 10 inch windbore; 30 fms. iron rods; bucket rods and bucket; flanch pins, pullies, and stands; balance bob and rod; shaft bob and main rod; sweep rods, swords, &c.; several fathoms of launders; whim chain, tackle, kibbies; bell and stand; 5 fm. ladder, and sundry timber and iron.

For inspection, apply to Mr. WM. GOSS, Lanivet.

HODGE, HOCKIN, AND MARRACK, Solicitors, Truro.

Dated Truro, Dec. 23, 1867.

In the Court of the Vice-Warden of the Stannaries.

Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACT, 1862, and of the WOODLEY LANE TIN WORKS MINING COMPANY.—TO BE SOLD, under the direction of the Registrar of the said Court, BY PUBLIC AUCTION, on Tuesday, the 7th day of January next, at Eleven o'clock in the forenoon, at the Prince of Wales Inn, Lanivet, within the said Stannaries, in lots, the MINE SETT or GRANT of the said company, and the undermentioned

MINING MACHINERY, MATERIALS, AND EFFECTS, viz.:—

24 in. STAMPING ENGINE, fly wheel and 9 tons BOILER, complete, with 64 heads of stamps, complete; stamps and frames for 12 heads, with iron axle and lifters; set of single, double, and treble iron blocks; lot of chain of different sizes; launders; large wheel pulley; bob and stand; wheel and handbarrows; old iron; shovels; zinc drawing lift; kieves; handracks; carpenters' bench and chests; brass and hair bottom sieves; a quantity of new and old wire for fencing; powder house; sundry lots of timber, &c.

The machinery and materials on St. Bennetts, comprising a good water wheel, with iron axle; 1 set of stamps; iron and wood lifters; and other effects in general use in mines.

To inspect the above, apply to Mr. WM. GOSS, Lanivet.

HODGE, HOCKIN, AND MARRACK, Solicitors, Truro.

Dated Registrar's Office, Truro, Dec. 23, 1867.

In the Court of the Vice-Warden of the Stannaries.

Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACT, 1862, and of the WEST WHEAL PROSPER MINING COMPANY.—TO BE SOLD, under the direction of the Registrar of the said Court, BY PUBLIC AUCTION, on Tuesday, the 7th day of January next, at the Prince of Wales Inn, Lanivet, within the said Stannaries, at Twelve o'clock at noon, in lots, the MINE SETT or GRANT of the said company, and the undermentioned

MINING MACHINERY AND MATERIALS, viz.:—

ONE 30 in. rotary STAMPING ENGINE, with fly wheel; 1 10 ton BOILER; 48 heads of stamps erected complete; 2 new iron stamp axles; about 12 cwts. of wire rope; wire rope cage for letting down tram wagons; stamps, guides, and tappets.

To view the above, apply to Mr. WM. GOSS, Lanivet.

HODGE, HOCKIN, AND MARRACK, Solicitors, Truro.

Dated Registrar's Office, Truro, Dec. 23, 1867.

Commercial Sale.

ON TUESDAY, JANUARY 14, 1868, at half-past Two o'clock prompt, at the Brokers' office, PIG IRON (North of England).

For further particulars and conditions of sale, apply to—

H. J. WALDUCK AND CO., METAL BROKERS,

1, Market-street, Manchester.

SOUTH WALES.

THE TON MAWR COLLIERY.

LEASEHOLD LANDS and MINES, in the Parish of BAGLAN, in the County of GLAMORGAN.

MR. JOHN M. LEEDER has been favoured with instructions from the Mortgagees TO SELL, BY PUBLIC AUCTION, at the Castle Hotel, Neath, on Thursday, the 16th day of January, 1868, subject to such conditions as shall then and there be produced, all those VALUABLE LEASEHOLD COLLIERIES called the

TON MAWR COLLIERIES,

Situate near NEATH, in the county of GLAMORGAN, comprising all the VEINS OF COAL, IRON ORE, IRONSTONE, FIRE CLAY, AND OTHER MINERALS lying under the following farms, viz.:—Abergwenfryd, Blaenafon, Bryncyneithwyn, Ton Mawr, and Wainllwyd (excepting the stone and stone quarry under Craigddu Plantation, part of the farm of Abergwenfryd), together with SEVEN COTTAGES and TWO LIME KILNS near the same, on the last-mentioned farm.

The COTTAGES and MINERALS under the farms of Abergwenfryd, Blaenafon, and Bryncyneithwyn, are held by lease for the residue of a term of 99 years, commencing on the 24th of June, 1861, at the annual rent of £42 8s. for the cottages, and for the mines and minerals a sleeping rent of £400, redeemable at royalties during the first seven years of the said term of 4d. per ton of 2520 lbs. avoirdupois for coal; 6d. per ton for ironstone; and 3d. per ton for stone and other minerals; and for the residue of the said term 6d. per ton for coal; 9d. per ton for ironstone; and 4d. per ton for stone and other minerals, with an average clause of three years. There is also a surface rent of £5 per acre per annum for lands that may be used.

The whole area of these farms, after deducting the Craigddu Plantation, is 436 A. 2 R. 16 P., more or less, the lease gives power to the lessee to determine the term at the end of the third or any subsequent year.

The MINES and MINERALS under Ton Mawr and Wainllwyd Farms are held by lease for the residue of a term of 99 years, commencing on the 29th September, 1861, at the annual sleeping rent of £100, redeemable by royalties of 3d. per ton of 2520 lbs. on coal, culm, iron ore, and ironstone, excepting on coal or culm used by the lessee or his agents for domestic purposes, or for working any engines, &c.; and 1d. per like ton of fire-clay converted into bricks for sale, with one year's average clause, and a surface rent of £2 per acre per annum for all lands that may be taken.

The lease gives power to the lessee to determine the lease at any time on giving 12 calendar months' notice in writing of his intention so to do.

The TON MAWR COLLIERIES have been well and extensively opened and worked by a level merely, and thus drain themselves without requiring pumps, hoisting apparatus, or machinery of any description. They have been proved to the extent of two miles ahead, so as to demonstrate that the coal is free from faults, and they are thoroughly ventilated and perfectly free from fire-damp. The quality of the coal has been long established at the large works in the locality, as well as in the mining districts of Devon and Cornwall.

The estate is intersected by the South Wales Mineral Railway, by which the coal from the several levels upon the property is conveyed to the docks at Britonferry, and to the large tin-plate, iron, and other works established there and in the neighbourhood of Neath, and it is connected with the main line of the South Wales Mineral Railway by a branch railway nearly a mile long, which has been constructed in a superior manner, and is included in the purchase.

Sale to take place at Three o'clock in the afternoon.

For further particulars, apply to Messrs. EADY and CHAMPION, Solicitors, 11, Park-street, Westminster, London; HOWELL CUTHBERTSON, Esq., Solicitor, Neath; or to the Auctioneer, at his offices, 16, Caer-street, Swansea.

PRELIMINARY ANNOUNCEMENT.

LANCASHIRE STEEL COMPANY (LIMITED).

MR. WHEATLEY KIRK is honoured with instructions from the Official Liquidators of the Lancashire Steel Company (Limited) to SELL, BY AUCTION, early in January next, 1868, at the Clarence Hotel, in Manchester, the EXCEEDINGLY VALUABLE PROPERTY, constituting their PATENT FILE WORKS AT MANCHESTER, viz.:—Land, buildings, steam-engines, boilers, shafting and mill-gearing, steam, water, and gas pipes, plant, machinery, utensils, &c.

Full particulars in future papers, or, in the interim, of Messrs. SLATER and BARLING, solicitors, 4, Norfolk-street; or of F. H. JEWSBURY, Esq., and THOS. BROWNING, Esq., official liquidators, 108, King-street; or the auctioneer, 8, Essex-street, King-street, Manchester.

ON SALE, a LARGE STOCK of NEW AND SECONDHAND STEAM-ENGINES, BOILERS, STEAM HAMMERS, ENGINEERS' TOOLS, and MACHINERY of every description.

For particulars, see WHEATLEY KIRK'S "Monthly Circular," by post, free.

NEW STEAM-ENGINES, BOILERS, COLLIERY AND CONTRACTORS' PLANT made at a short notice.

BEST MATERIALS AND WORKMANSHIP GUARANTEED.

8, ESSEX STREET, AND STORES, 21, OLD GARRATT, MANCHESTER.

FOR SALE, a PORTABLE STEAM ENGINE of 25 horse power. Winding gear to order to suit circumstances. SECOND-HAND PORTABLE STEAM ENGINES, with new MORTAR-MILLS, SAW TABLES, &c., on advantageous terms.

Apply to Messrs. BARROWS and CARMICHAEL, Engineers, Banbury, Oxon.

TO MINE ADVENTURERS AND AGENTS.

FOR SALE,—

THE UNDERMENTIONED

ENGINES AND MATERIALS,

At the following very LOW PRICES:—

ONE highly-polished 40 inch cylinder PUMPING ENGINE, 9 feet stroke, with 11 ton boiler, in first-rate condition	£ 300 0 0
ONE very bright 50 inch cylinder PUMPING ENGINE, 10 feet stroke, with 19 tons of boilers, first piece of main rod and caps, in excellent condition	375 0 0
ONE 40 inch cylinder STAMPING ENGINE, very bright, and in splendid condition, with two first-rate boilers, weighing (with the mountings) about 25 tons, new connection rod, two new fly wheels, saddles, and shafts (about 23 tons in weight), and the whole of the castings and brasses necessary to complete a steam stamps of 96 heads, entirely new, never having been erected. [The last-named is an exceedingly cheap lot, being all new, excepting the indoors portion of the engine, which is equal to it.]	1000 0 0
ONE 30 inch cylinder PUMPING ENGINE, with 8 ton boiler	225 0
ONE 8-horse power PORTABLE STEAM ENGINE, for agricultural purposes	45 0 0
ONE 8-ton BOILER	50 0 0
Sixteen heads of STAMPS complete, in wood, iron, and brass, four cams to the round, very good	30 0 0
TWO 16-head STAMP AXLES, new, four cams to the round, never worked	34 0 0
Several 24-head STAMP AXLES, with the necessary saddles, brasses, braces, cams, tongues, grate plates, stamp heads, entirely new, never worked, at per set of 24 heads	92 0 0
TWENTY 10 inch PUMPS, new, at per cwt.	0 5 0

A large quantity of secondhand PITWORK of all kinds, BALANCE BOBS, SHAFT BOBS, ROD PLATES and BOLTS, FLAT ROPES and PULLIES, and various other materials at equally low prices.

Apply to— WILLIAM DERRY,

HIGHER FOUNDRY, ST. AUSTELL, CORNWALL.

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SPARE MACHINERY, &c., viz.:—

ONE 80 in. cylinder PUMPING ENGINE, with THREE BOILERS and balance-bob, &c., complete.

ONE 72 in. cylinder PUMPING ENGINE (Bull), with TWO BOILERS, &c.

ONE 24 in. cylinder WINDING ENGINE, BOILER, cage, &c.

ONE 26 in. cylinder WINDING ENGINE, TWO BOILERS and steam capstan attached.

ONE 36 in. cylinder STAMPING ENGINE, BOILER, &c., with cast-iron axle for 60 heads, nearly new; 14 ft. calciner, complete.

Between 300 and 400 first-rate PUMPS from 6 to 20 inch, with windbores, matchings, H pieces, &c., &c.; 14 plunger poles from 7 to 20 in., with stuffing boxes and glands to fit.

A quantity of hammered iron rod plates, rod pins, staples and glands, &c.; a quantity of pitch pine and other main rods from 10 to 15 in.; 2 capstans and 3 shears; capstan rope, chains, and a variety of other articles.

For viewing the same, apply to the Agents.

Further particulars may be had of Mr. WM. POLKINGHORNE, the purser, at the mine; or of WM. WEST, Esq., C.E., Tredenham House, St. Blazey.

Dated Par Consols Mine, Par Station, Cornwall, 21st November, 1867.

COUNTY OF WICKLOW.

TO BE LET, on such terms as may be agreed upon, the

GLENMALUR LEAD MINE,

In the townland of BALLINAFUNCHOGE, barony of BALLINACOR NORTH and county of WICKLOW.

The mine is situate on the east side of the valley of Glenmalur, about eight miles from the town of Rathdrum, in a mineralised district of great promise. It has been worked for a considerable time up to a recent period, and was very productive. A large water-wheel, connected with a pumping apparatus, is at present employed keeping the workings clear of water. A railway is laid through, and in the adit level. Abundant supply of water power is available from the Avonbeg River adjoining, and other sources. Timber for use of the mine can be obtained on advantageous terms on the grounds. Houses suitable for the superintendents and workmen, offices, and workshops, are on the premises, and land can be given for any further accommodation that may be necessary.

Parties desirous of proposing for the mine can obtain particulars as to its extent, state, and conditions on which it will be let, on application to JOHN HILL, Esq., Civil Engineer, Ennis.

Proposals will be received by Messrs. G. and R. K. JOHNSTON, Dundalk.

TO BE LET, the COAL and other MINERALS under about SEVENTY-NINE STATUTE ACRES of LAND, three miles from MOLD, NORTH WALES. The various seams of coal, cannel, &c., of the Mold district are now being worked at adjoining collieries. A branch of the London and North-Western Railway runs through the property.

A plan of the property, and a section of the strata, can be seen at the office of Mr. T. L. COTTINGHAM, M.E., Wrexham-street, Mold, from whom all information can be obtained.

SLATE QUARRY.—TO BE LET OR SOLD, the WHOLE or a PART of a VALUABLE and PRODUCTIVE BLUE SLATE QUARRY, of superior quality, situate in North Wales.

For particulars and terms, apply to Mr. PANNETT, 5, Herbert-place, or at the *Cambrian* Newspaper Office, Swansea.

COAL CUTTING MACHINERY.—The WEST ARDSLEY COMPANY having, by recently patented improvements, perfected their coal cutting machinery, worked by compressed air, are NOW READY to MAKE CONTRACTS for the CONSTRUCTION and USE of their MACHINES.

The results of twelve months' experience in the working of these machines, by the West Ardsley Company, have proved most satisfactory, their use being found to CHEAPEN the COST and IMPROVE the average SIZE of the COAL, to LIGHTEN the LABOUR, and also to MODIFY the SANITARY CONDITION of the MINE.

All communications to be made to Messrs. FIRTH, DONISTHORPE, and BOWER, No. 8, Britannia-street, Leeds.

NOTICE.—The WEST ARDSLEY COMPANY, having reason to believe that their patents are being infringed upon, hereby give notice that they will TAKE LEGAL PROCEEDINGS AGAINST ALL PARTIES who may MAKE FOR SALE, or USE ANY MACHINERY in the construction of which any such INFRINGEMENT is MADE.

Now ready, price 36s., 15s., and 10s., with Map,

POST-OFFICE LONDON DIRECTORY FOR 1868

(SIXTY-NINTH YEAR).

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BEING A PRACTICAL GUIDE FOR PROJECTORS, PROMOTERS, DIRECTORS, SHAREHOLDERS, CREDITORS, SOLICITORS, SECRETARIES, AND OTHER OFFICERS.

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This book contains a popular exposition of the law relating to public companies as it at present stands, and is written in a style readily intelligible to non-professional readers. Legal technicalities have been, as far as practicable, avoided, and the information given has been so arranged as to present itself in the order in which it will be required by those concerned.

London: MINING JOURNAL Office, 26, Fleet-street.

Now in the Press, price 5s

STATISTICS OF THE MINES OF CORNWALL AND DEVON, WITH OBSERVATIONS UPON THEM.

By THOMAS SPARGO, STOCK and SHAREDEALER, GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C.

I beg to inform the mining interest that my work, under the above title, will be issued at the end of this month. It will contain the following particulars—viz., the geological position, present prospects, names of purser, manager, and secretary, with statement of the annual returns of each mine during the last two years, and of total dividends paid to the present time. The work will be illustated by a map of Cornwall and Devonshire; geological district maps, divided into eight sections, in which will be shown the boundary lines of each parish, height of hills, sources of rivers, &c.; maps of St. Just, St. Ives, Marazion, Helston, Gwinear, Chiverton, Bodmin, Liskeard, Devon Great Consols, Ashburton, and Exmouth mining districts, showing boundary lines of each property, with the lodes, &c., traversing them.

It will also contain transverse and longitudinal sections of Dolcoath Mine (kindly supplied by Captain Charles Thomas); section of workings in Botallack Mine (supplied by the manager, S. H. James, Esq.); longitudinal sections of workings upon the main lode in Great Wheal Vor and Tresavean Mines; geological map of the Fowey district (supplied by Major Davis, R.M.); historical account of the Devon Great Consols, and of all the principal mines in the two counties.

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UNDER OFFICIAL PATRONAGE.

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NOTES ON THE MINES OF THE RIO TINTO DISTRICT:

Containing a DETAILED REPORT upon the MINES and on the MEANS of RENDERING THEM MORE PROFITABLE, as well as an ACCOUNT of the PROCESS of TREATING POOR ORES of COPPER, successfully used there.

By JOSEPH LEE THOMAS, Assoc. I.C.E.

London: MINING JOURNAL Office, 26, Fleet-street, E.C.

IMMENSE SAVING OF LABOUR.

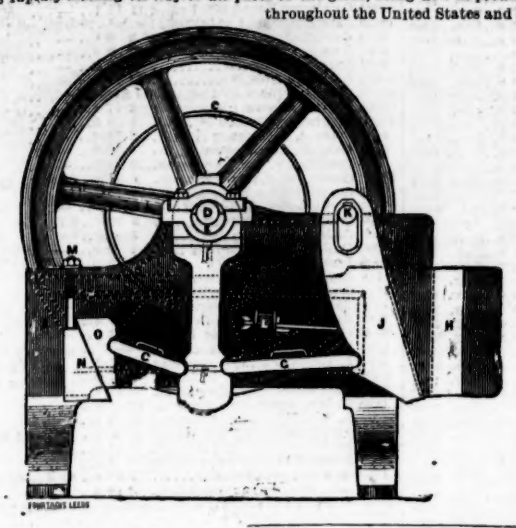
TO MINERS, IRONMASTERS, MANUFACTURING CHEMISTS, RAILWAY COMPANIES, EMERY AND FLINT GRINDERS, McADAM ROAD MAKERS, &c., &c.

BLAKE'S PATENT STONE BREAKER,

OR ORE CRUSHING MACHINE,

FOR REDUCING TO SMALL FRAGMENTS ROCKS, ORES, AND MINERALS OF EVERY KIND.

It is rapidly making its way to all parts of the globe, being now in profitable use in California, Washoe, Lake Superior, Australia, Cuba, Chili, Brazil, and throughout the United States and England. Read extracts of testimonials:—



The Parys Mines Company, Parys Mines, near Bangor, June 6.—We have had one of your stone breakers in use during the last twelve months, and Captain Morcom reports most favourably as to its capabilities of crushing the materials to the required size, and its great economy in doing away with manual labour.
For the Parys Mining Company, JAMES WILLIAMS.
H. R. Marsden, Esq.

Ecton Emery Works, Manchester.—We have used Blake's patent stone breaker made by you, for the last 12 months, crushing emery, &c., and it has given every satisfaction. Some time after starting the machine a piece of the moveable jaw s about 20 lbs. weight, chilled cast-iron, broke off, and was crushed in the jaws of the machine to the size fixed for crushing the emery.
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General Frémont's Mines, California.—The 15 by 7 in. machine effects a saving of the labour of about 30 men, or $75 per day. The high estimation in which we hold your invention is shown by the fact that Mr. Park has just ordered third machine for this estate. SILAS WILLIAMS.

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MEADOW LANE, LEEDS,
ONLY MAKER IN THE UNITED KINGDOM.

CAUTION!

BLAKE'S PATENT STONE BREAKER,

In Chancery.

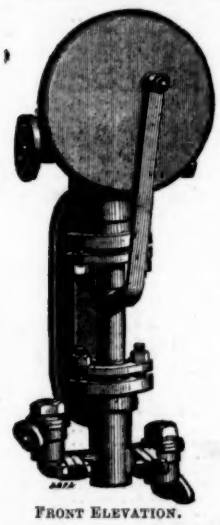
BLAKE v. ARCHER, NOVEMBER 12, 1867.

His Honour the Vice-Chancellor WOOD having found a VERDICT in FAVOUR of the PLAINTIFFS in the above Cause, establishing the VALIDITY of BLAKE'S PATENT, and made a DECREE for an INJUNCTION to RESTRAIN the DEFENDANTS, Messrs. THOMAS ARCHER and SON, of Dunston Engine-Works, near Gateshead-on-Tyne, from INFRINGING such PATENT, and ordering them to pay to the Plaintiffs the costs of the Suit.

ALL PERSONS are hereby CAUTIONED against MANUFACTURING, SELLING, or USING any STONE BREAKERS similar to BLAKE'S, which have not been manufactured by the Plaintiffs. Application will forthwith be made to the Court of Chancery for INJUNCTIONS AGAINST ALL PERSONS who may be found INFRINGING BLAKE'S PATENT after this notice.

SOLE MAKER IN ENGLAND,

H. R. MARSDEN, SOHO FOUNDRY, MEADOW LANE, LEEDS.



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THE NEW PATENT INJECTOR,

FOR FEEDING BOILERS AND RAISING WATER FOR OTHER PURPOSES.

PRICES, DELIVERED IN LONDON.

Size.	Ram. in.	Stroke. in.	Approx. horse-power boiler supplied.	Approximate gallons thrown per hour. At 100 rev.	150 rev.	200 rev. p. min.	Price.
No. 4	1¼	3	15	115	172	230	£10 10
5	1⅞	3	22	180	270	360	12 12
6	1⅞	4	30	240	360	480	14 14
7	2¼	4	40	345	517	690	17 0
8	2½	5½	55	475	712	950	19 10
9	2½	5½	75	585	877	1170	22 10
10	2½	6¾	90	720	1080	1440	25 10
11	2¾	6¾	110	870	1305	1740	28 10
12	2¾	8	120	1080	1545	2060	31 10
*14	3	8	230	2450	3675	—	40 0
*16	3¼	8	460	4900	7350	—	55 0

* The two last are double-acting.

Steam Regulator Valves, and also Check Valves, specially made to suit these Engines, can be supplied.

Terms: Nett Cash on Delivery.

A CIRCULAR, WITH FULL EXPLANATION AND COMPARISONS, WILL BE SENT ON APPLICATION.

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PATENT FLAT AND ROUND WIRE ROPES,
From the very best quality of charcoal iron and steel wire.

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SHIPS' RIGGING, SIGNAL AND FENCING STRAND, LIGHTNING CONDUCTORS, STEAM PLOUGH ROPES (made from Webster and Horsfall's patent steel wire), HEMP, FLAX, ENGINE YARN, COTTON WASTE, TARPAULING, OIL SHEETS, BRATTICE CLOTHS, &c.

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MANUFACTURERS of FLAT and ROUND HEMP and IRON and STEEL WIRE ROPES for MINING, RAILWAY, and SHIPPING PURPOSES.
MANILLA ROPE of SUPERIOR QUALITY, FIFTY PER CENT. STRONGER and THIRTY PER CENT. CHEAPER than Russian hemp rope.
WIRE ROPE of FIRST QUALITY WIRE, and the HIGHEST STANDARD of STRENGTH.

STEAM-BOILERS made by WILLIAM WILSON, LILYBANK BOILER WORKS, GLASGOW, on the most improved principles, for home and export. All boilers made of the best material and workmanship, proved and warranted tight under a high pressure, and delivered at any railway station or shipping port in the kingdom at moderate rates. Lithograph of boilers forwarded post-free on application.

DYNAMITE, OR NOBEL'S PATENT SAFETY BLASTING POWDER,
May now be had from
MESSRS. WEBB AND CO., CARNARVON,
Sole consignees from the patentee.

This powerful BLASTING AGENT will not explode from a spark, or concussion alone, but requires the combined effect of both, and is fired by a strong percussion cap and ordinary fuse. In a compressed state it may be fired in damp holes, or under water.
Force, SEVEN TIMES that of the BEST GUNPOWDER.
It will shiver to pieces cast or wrought-iron, or the toughest teak timber. No tamping is required. It is by far the safest explosive for blasting purposes ever discovered.

NITRO-GLYCERINE, OR NOBEL'S PATENT BLASTING OIL.

THE EXPLOSIVE FORCE of this BLASTING OIL is TEN TIMES that of GUNPOWDER, and the ECONOMY and SAVING in TIME, LABOUR, and COST in removing granite and hard rock, in sinking shafts, driving tunnels, and opening forward in close ends is immense.
It will not explode from a spark or fire, but from concussion alone, and is consequently much less dangerous than gunpowder or gun-cotton.
Being heavier than water it sinks to the bottom of a wet hole, no other tamping than water being required.
One charge of this blasting oil, which is now being used with wonderful effect in all the largest slate quarries in North Wales, will displace as much slate rock as four or five charges of gunpowder; and its great force, acting on a large quantity of good slate rock, shakes and displaces it at the natural joints, or cracks, without damaging the slabs nearly so much as the more numerous blasts from any other blasting material would do.
This invaluable quarrying agent may now be obtained from Messrs. WEBB and Co., Carnarvon, sole consignees from the patentee.

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ALL ORDERS FOR ABROAD RECEIVE their BEST ATTENTION. NICHOLLS, MATHEWS, and Co. have had 20 years' experience in supplying machinery to foreign mines, and selecting experienced workmen to erect the same, where required.
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CALL the ATTENTION of COLLIERY PROPRIETORS and others to the present favourable opportunities for the purchase of secondhand CORNISH PUMPING ENGINES and BOILERS at cheap rates. Plans, valuations, removal, &c., of every description of mining machinery undertaken.
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MANUFACTURERS of STEAM PUMPING and EVERY OTHER KIND of ENGINES, together with BOILERS, PUMP CASTINGS, and MINING TOOLS of every description, of the very best quality. Estimates given for the supply of any amount of machinery.
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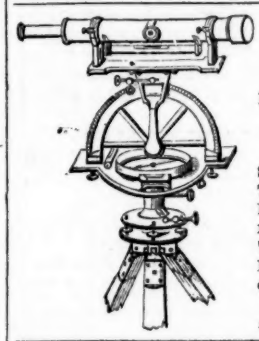

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MONTGOMERYSHIRE (late manager of the Brynpastig and Cwm Fron Mines, and others, in Shropshire and Wales), is NOW OPEN to INSPECT and faithfully REPORT UPON ANY LEAD MINE in either of these localities that may be confided to his care, having had better than 30 years' experience in lead mining, as miner and agent.—Address, Capt. S. M. RIDGE, Llanidloes, Montgomeryshire.

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THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Per share.	Last paid.
1500	Alderley Edge, c, Cheshire*	10 0 0	—		9 2 8	0 5 0	Nov. 1867
200	Botallack, t, c, St. Just	91 5 0	200	175 200	488 15 0	5 0 0	May 1866
4000	Brookwood, c, Buckfastleigh	1 11 0	—		0 7 6	0 2 6	Dec. 1867
1000	Bronfloyd, l, Cardigan*	12 0 0	—		8 17 0	0 10 0	Nov. 1867
6400	Cashwell, l, Cumberland*	2 10 0	—		0 1 6	0 1 6	Aug. 1866
916	Cargoll, s-l, Newlyn	15 5 7	—		13 15 0	1 0 0	Feb. 1866
509	Creegbrawse and Penkevil, t	—	—		1 0 0	1 0 0	Oct. 1867
867	Cwm Erfin, l, Cardiganshire*	7 10 0	—		24 18 0	1 0 0	Oct. 1867
128	Cwmystwith, l, Cardiganshire	60 0 0	—		381 10 0	2 0 0	Dec. 1867
280	Derwent Mines, s-l, Durham	300 0 0	—		174 10 0	5 0 0	June 1867
1024	Devon Gt. Consols, c, Tavistock†	1 0 0	430	400 430	1081 0 0	7 0 0	Nov. 1867
656	Ding Dong, t, Gulval‡	49 14 6	—		0 10 0	0 10 0	Sept. 1867
358	Dolcoath, c, t, Camborne	128 17 6	—		837 10 0	3 0 0	Dec. 1867
6144	East Caradon, c, St. Cleer†	2 14 6	5¼	4¾ 5	14 11 6	0 2 0	July 1867
300	East Darren, l, Cardiganshire	32 0 0	—		150 10 0	2 0 0	Dec. 1867
128	East Pool, t, c, Pool, Illogan	24 5 0	—		417 10 0	5 0 0	Nov. 1867
1906	East Wheal Lovell, t, Wendron	3 9 0	8⅜	8 8¼	3 11 6	0 10 0	Dec. 1867
2800	Foxdale, l, Isle of Man*	25 0 0	—		71 0 0	0 10 0	Sept. 1867
5000	Frank Mills, l, Christow	3 18 6	—		3 5 6	0 5 0	Feb. 1866
15000	Great Laxey, l, Isle of Man*	4 0 0	18½	17 17½	7 15 0	0 10 0	Dec. 1867
5908	Great Wheal Vor, t, c, Helston†	40 0 0	17½	16 17	12 8 0	0 7 6	Dec. 1867
1024	Herodsfoot, l, near Liskeard†	8 10 0	40	38 40	43 10 0	1 10 0	Oct. 1867
6000	Hingston Down, c, Calstock†	5 10 6	2		0 10 0	0 5 0	April 1866
400	Lisburne, l, Cardiganshire	18 15 0	—		498 10 0	3 0 0	Dec. 1867
3000	Maes-y-Safn, l, Flint*	20 0 0	27½	25 27	3 0 0	1 0 0	Dec. 1867
9000	Marke Valley, c, Caradon	4 10 6	6½	6⅛ 6⅜	4 1 0	0 4 0	Oct. 1867
3000	Minera Boundary, l, Wrexham*	1 0 0	—		0 13 0	0 3 0	Mar. 1866
1800	Minera Mining Co. l, Wrexham*	25 0 0	180	175 180	223 13 0	4 15 0	Nov. 1867
20000	Mining Co. of Ireland, c, l, cl.	7 0 0	—		—	0 5 7	Jan. 1867
10000	Mwyndy Iron Ore*†	3 5 0	—		0 6 6	0 2 6	Mar. 1866
200	Parys Mines, c, Anglesey*	50 0 0	—		157 10 0	5 0 0	Jan. 1866
12800	Prince of Wales, t, Calstock	0 12 6	2½	48s. 50s.	0 3 6	0 1 0	Nov. 1867
6000	Prosper United, t, c, St. Hilary	8 14 0	—		0 5 0	0 5 0	Feb. 1867
1120	Providence, t, Uny Lelant†	10 6 7	28	26 28	84 2 6	0 15 0	Nov. 1867
512	South Caradon, c, St. Cleer†	1 5 0	410	400 410	568 10 0	6 0 0	Nov. 1867
6000	South Darren, l, Cardigan*	3 6 6	—		0 8 6	0 1 6	Oct. 1867
496	So. Wh. Frances, c, Illog.†‡	18 18 9	27	24 26	372 13 6	1 0 0	Nov. 1867
508	Summer Hill, l, Mold	3 13 6	—		1 15 0	0 7 6	Dec. 1867
6000	Tincroft, c, t, Pool, Illogan†	9 0 0	14½	13 14	19 1 0	0 5 0	Nov. 1867
2000	Trumpet Cons., t, Helston	11 10 0	11	9 11	12 0 0	0 7 6	Dec. 1867
3000	W. Chiverton, l, Perranzabuloe†	10 0 0	67½	66 68	23 7 6	2 0 0	Nov. 1867
400	W. Wheal Seton, c, Camborne†	47 10 0	195	190 195	485 0 0	4 10 0	Dec. 1867
512	Wheal Basset, c, Illogan†	5 2 6	88	75 80	629 0 0	2 0 0	Dec. 1867
1024	Wheal Friendship, c, Tavistock	20 0 0	—		300 10 0	0 10 0	Nov. 1866
4295	Wheal Kitty, t, St. Agnes	5 4 6	3		3 3 0	0 2 0	Nov. 1867
1024	Wheal Mary Ann, l, Menheniot†	8 0 0	20½	19 20	63 7 6	0 17 6	Dec. 1867
2000	Wheal Rose, c, Scorrier	—	—		1 0 0	0 10 0	Feb. 1866
396	Wheal Seton, t, c, Camborne	58 10 0	82½	82½ 87½	252 15 0	3 0 0	Dec. 1867
3000	Whitewell Lead, Clitheroe*	0 5 0	—		1 0 0	0 10 0	Dec. 1867
17000	Wicklow, c, t, Wicklow	2 10 0	—		48 10 0	0 15 0	Oct. 1867

FOREIGN DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Per share.	Last paid.
25000	Alamillos, l, Spain*†	2 0 0	1½		0 1 0	0 1 0	Oct. 1867
20000	Australian, c, South Australia†‡	7 7 6	—		0 1 0	0 1 0	Aug. 1867
15000	Cape Copper Mining*†	7 0 0	7½	7 8	2 12 6	0 10 0	April 1866
76000	Don Pedro North del Rey*†‡	0 14 0	3¼	3½ 3¾	0 10 9	0 3 0	Nov. 1867
25000	Fortuna, l, Spain*†	2 0 0	—		1 7 4	0 2 0	Oct. 1867
20000	Gen. Mining Assoc., Nova Scotia†	20 0 0	—		23 10 0	0 15 0	June 1867
10000	Gonnesa, l,* [5000 £5 pd., 5000 £4 pd.]		—		10 per cent.		July 1867
68000	Kapunda Mining Co., Austra†‡	1 0 0	—	⅜ ½	0 0 10	0 0 10	Nov. 1867
15000	Linares, t, Spain*†	3 0 0	—		11 8 4	0 2 0	Oct. 1867
50000	Panulcillo, c, Chili*†	3 0 0	—	¾ 1	10 per cent.		Yearly.
6000	Peel River Land and Mineral*†	100 0 0	—		—	—	
80000	Pestarena, g, Italy*†	2 12 6	2⅞	2⅜ 2⅝	0 2 6	0 2 6	Mar. 1867
100000	Pontgibaud, s-l, France†	20 0 0	—		4 14 3	0 11 0	June 1867
10000	Port Phillip, g, Clunes†	1 0 0	1⅜	1¼ 1½	0 18 6	0 1 0	Oct. 1867
20000	Scottish Australian Min. Co.†	1 0 0	1⅛		7½ per cent.		Nov. 1867
11000	St. John del Rey, Brazil*†	15 0 0	59	57½ 58½	81 10 0	4 5 0	Dec. 1867
50000	Victoria (London) [25000 £1 pd., 25000 12s. 6d. pd.]				0 9 0	0 1 0	Jan. 1866
40000	West Canada Mining Co.*	1 0 0	—		0 19 6	0 2 6	May 1866

NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.	Last Call.
50000	Anglo-Argentine, s, Argentine Republic*	1 0 0	—		
100000	Anglo-Brazilian, g*†	0 10 0	⅝	½ ⅝	Nov. 1866
12500	Anglo-Italian, g*†	0 5 0	—	¼ ½	May 1867
2464	Burra Burra, c, South Australia‡	5 0 0	30		
25000	Capula, s, Mexico*†	1 12 0	—		Aug. 1866
30000	Chontales, g, s, Nicaragua*†	4 10 0	3⅝	3⅜ 3⅝	Nov. 1867
12000	Cobre Copper Company, c, Cuba†‡	43 10 0	—		May 1867
10000	Copiapo Mining Company, Chili†‡	16 10 0	—		
10000	Copiapo Smelting, Chili*	10 0 0	—		April 1866
300	Copper Miners' Co. of South Australia* [150 £100 pd., 150 £70 pd.]				Nov. 1866
15000	El Chico Silver Mining and Reduction Company*	5 0 0	—		Nov. 1866
8000	English and Canadian Mining Company*	5 0 0	—		Fully pd.
40000	Fortune Copper Mining Co. of Western Australia	2 0 0	—		Fully pd.
50000	Frontino and Bolivia, g, New Granada*†	1 15 0	⅞	¾ ⅞	June 1867
10000	Great Barrier Land, Mining, &c., New Zealand	5 0 0	—		Fully pd.
80000	Great Northern, c, South Australia†	1 11 6	—		Sept. 1862
7927	Lusitanian (Portugal)†‡	3 0 0	—		
83090	Mariquita, g, s, New Granada	0 17 6	—		Sept. 1867
12500	Nerbudda Coal and Iron, India*†	6 0 0	—		Dec. 1867
51000	New Quebrada, c, Venezuela*†	3 10 0	—		
50000	Nova Scotia Land and Gold*	1 15 0	—		Sept. 1865
15000	Otea, c, New Zealand*	2 0 0	—		Fully pd.
10178	Rhenish Consolidated, l [6000 £5 pd., 4178 £2 10s. pd.]	—	—		May 1866
100000	Rossa Grande, g, Brazil*†	0 12 0	½	¼ ½	June 1867
15000	San Pedro del Monte, s, Mexico*	4 0 0	—		Sept. 1866
10000	San Roque, l, Spain	5 0 0	—		Fully pd.
100000	Taquaril, g, Brazil*	0 5 0	—		Oct. 1867
6000	Terreseu, s-l, Isle of Sardinia	2 0 0	—		
43174	United Mexican, s, Mexico†‡	28 5 0	1½	1⅜ 1⅝	
10000	Vancouver, cl*†‡	6 0 0	—		
6000	Val Sassam, s, c, l, Italy*†	7 0 0	—		Aug. 1867
45000	Victor Emanuel, c, Italy*	1 0 0	—		Fully pd.
20000	Washoe, g, Nevada†	5 0 0	—		Fully pd.
80000	Worthing, c, South Australia*†	1 0 0	—		Fully pd.
75000	Yorke Peninsula, South Australia	1 0 0	—		Fully pd.
45000	Yudanamutana, c, South Australia*†‡	3 0 0	1⅛	⅞ 1	Fully pd.

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.	Last Call.
4000	Bedford United, c, Tavistock*	2 6 8	—		
5000	Bryn Gwiog, l, Flint	0 18 0	—		June 1864
914	Caradon Consols c, St. Cleer	32 13 6	—		Aug. 1867
1000	Carn Brea, c, t, Illogan‡	28 0 0	21	20 21	May 1867
5000	Carnarvonshire, l, Carnarvon*	4 0 0	5¼	5 5¼	Fully pd.
3000	Chiverton, l, Perranzabuloe	9 12 6	5	5 5¼	Nov. 1867
3000	Chiverton Moor, l, Perranzabuloe	6 8 6	5½	5½ 5⅝	Aug. 1867
2880	Clifford Amalgamated, c, Gwennap‡	33 17 6	6	5¾ 6	June 1867
2450	Cook's Kitchen, c, Illogan‡	19 14 9	10	9 9½	July 1866
1055	Craddock Moor, c, St. Cleer‡	12 18 0	—		Nov. 1867
12800	Drake Walls, t, Calstock‡	2 5 0	½	⅜ ½	Dec. 1866
512	East Basset, c, Redruth†‡	33 10 0	—	9 11	Nov. 1867
6000	East Carn Brea, c, Redruth‡	3 15 0	2½	2⅛ 2⅜	
6000	East Grenville, c, Camborne	3 12 6	2	1¾ 2	Nov. 1867
4000	East Wheal Russell, c, Tavistock†	12 10 6	1⅜	1⅜ 1⅝	Oct. 1867
6144	Gonamena, c, St. Cleer	7 3 6	½		Dec. 1867
5000	Great North Downs, c, Redruth	6 13 0	—	4¼ 4½	Feb. 1867
4800	Great Retallack, s-l, b, Perranzabuloe	2 4 0	3	2½ 3	July 1867
6000	Great South Chiverton, s-l, Perranzabuloe	1 10 6	1		Oct. 1867
6000	Great South Tolgus, c, Redruth	1 4 0	1	1 1⅛	June 1867
1798	Great Wheal Fortune, t, Breage	30 10 6	—		Nov. 1867
1024	Nangiles, t, c, Kea	28 17 0	—		Oct. 1867
400	New Wheal Seton, c, Camborne	58 10 0	70	65 70	Aug. 1867
3457	North Downs, c, Redruth	5 3 10	¾	½ ¾	Sept. 1867
695	North Roskear, c, Camborne	54 17 0	—	5 6	Nov. 1867
5936	North Treskerby, c, St. Agnes	1 9 0	32s.	29s. 31s.	Dec. 1860
5610	North Wheal Crofty, c, Illogan†	3 11 3	2¾	2¼ 2½	July 1866
3000	North Wheal Chiverton, l, Perranzabuloe	4 0 0	—		Mar. 1867
5000	Old Westminster, l, Denbigh	2 0 0	7½	5 7	June 1867
8465	Pedn-an-drea, t, Redruth	6 8 6	—		Nov. 1867
1024	Rose and Chiverton United, l, Newlyn	5 0 0	—	5½ 6½	Nov. 1867
6138	South Condurrow, t, c, Camborne	3 18 6	¾	½ ¾	Oct. 1867
940	St. Ives Consols, t, St. Ives‡	10 15 0	—		Nov. 1867
920	Stray Park, c, t, Camborne†‡	44 0 8	2¾	3 4	Oct. 1867
6000	Tamar Valley, s-l, Beeralston	0 5 0	—		Nov. 1866
548	Trelyon Consols, t, St. Ives	16 0 0	—		Dec. 1866
6000	West Basset, c, Illogan†‡	1 15 0	2⅜	2 2¼	Mar. 1867
1024	West Caradon, c, St. Cleer†‡	19 0 0	11	10½ 11	Nov. 1866
12800	West Drake Walls, c, Calstock	0 2 6	—		Mar. 1867
5000	West Godolphin, t, c, Breage	0 1 0	—		
2582	West Great Work, t, Breage	5 11 0	—		June 1866
6000	Westminster, Flint, l*	5 0 0	5½	5 5½	Fully pd.
6000	West St. Ives, t, c, St. Ives	0 1 0	—	⅜ ½	Oct. 1865
5000	West Wheal Kitty, t, St. Agnes	2 19 6	⅞	¾ ⅞	Dec. 1867
6000	Wheal Agar, c, Illogan	7 8 6	—		July 1867
512	Wheal Buller, c, Redruth†‡	22 15 0	18	15 17½	Oct. 1867
6000	Wheal Crebor, c, Tavistock	2 5 6	—		Nov. 1867
849	Wheal Emily Henrietta, c, Illogan	19 5 0	41	10½ 11	Oct. 1867
6000	Wheal Grenville, c, Camborne†	10 5 0	1⅞	24s. 26s.	Sept. 1867
1040	Wheal Trelawny, s-l, Liskeard†	6 17 0	—	5½ 6	Dec. 1867
5000	Wheal Uny, t, c, Redruth	10 14 6	1½	1⅜ 1⅝	Oct. 1867

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.
4000	Ballacorkish, I. of Man, l, c*	3 5 0	—	
1031	Bedol Aur, l, Holywell	1 12 0	—	
1248	Boscaswell, t, c, St. Just	7 6 0	—	
2500	Bosworthen and Penzance	4 0 0	—	
5000	Bottle Hill, t, Plympton	1 14 6	—	
1200	Bryn Gwyn, l, Mold*‡	9 0 0	—	
1000	Budnick Cons., c, t, Perranz.	—	—	
6000	Bwadrain Consols, c	3 2 0	—	
5094	Bwlch Consols, s-l, Cardigan	4 0 0	—	
30000	Caldbeck Fells, l, Cumberld.*	1 10 0	—	
1000	Camborne Consols, c	18 10 0	—	
4600	Camborne Vean & Wh. Frn., c	11 18 1	—	
11000	Cape Cornwall, t, c* [8000 £2 10s. pd., 3000 25s. pd.]			
1000	Cardynham China-clay*	3 0 0	—	
6000	Carn Camborne, c, Cambrn.	2 3 0	—	
4005	Cardigan Consols*	5 0 0	—	
600	Cardiganshire, l*	17 10 0	—	
20000	Carysfort [3200 £2½ pd., 16800 £1½ pd.]			
2500	Central Minera, l, Wrexham*	3 17 6	—	
16000	Central Snailbeach l*	1 0 0	—	
4000	Clara, l, Llywernog	2 18 6	—	
2048	Colquite & Callington U., c	0 5 0	—	
256	Condurrow, c, t, Camborne‡	76 10 0	—	
50000	Connorree, c, sul, Wicklow*	1 0 0	6s.	6s.
988	Copper Hill, c, Redruth‡	12 10 0	—	
7324	Cornish Clay and Tin Works	1 0 0	—	
12000	Crelake, c, Tavistock	3 12 0	1⅛	
6000	Cuddra, t, St. Austell	5 5 0	—	
40000	Dale, l, North Stafford	1 0 0	—	
25000	Dundalk, Ireland, l*	0 15 0	—	
740	Eaglebrook, l, Talybont*	19 15 0	—	
1000	East Basset and Grylls, t	3 5 0	—	
4000	East Chiverton, l, Perranz.	2 14 3	—	
4000	E. Gunnislake & S. Bed. c	10 12 6	1⅞	1¾ 2
6000	East Laxey, l, Isle of Man	2 15 0	—	
6000	East Neptune, c, Marazion	—	—	
5000	E. Rosewarne, c, t, Gwinear	2 17 0	½	¼ ½
6000	East Snaefell, l, I. of Man*	2 10 0	1½	1¼ 1½
5610	East Seton, c, Camborne	0 13 6	—	
1190	E. Wh. Agar, c, St. Cleer	12 17 0	—	
5000	E. Wh. Rose Con., l, Per.*	2 0 0	—	
6000	Ebury Lead Min. Co., Flint*	1 5 0	1½	1 1½
6000	Fortescue Cons., c, Tavistock	0 12 6	—	
940	Fowey Con., c, Tywardreath‡	5 4 6	—	
4000	Gawton, c, Tavistock	3 10 6	3¾	3¼ 3½
6000	Gen. Min. Co. for Ireland, c	5 10 0	2⅛	
40000	Glasgow Caradon c* [30000 £1 pd., 10000 15.pd.]			
5700	Goginan, Cardigon, l	12 10 0	—	
6000	Gothic, s-l, Cardigan*	2 10 0	—	
486	Grambler & St. Aubyn, c†‡	72 0 0	—	
10000	Great Cwmsymlog, s-l*	1 15 0	—	
4096	Great Caradon, c, St. Ive	3 15 0	—	
3000	Gt. Chiverton, s-l, Perranz.*	2 10 0	—	
3000	Gt. East Lovell, t, Helston	2 1 0	—	
5000	Great Mona, l, Isle of Man*	4 0 0	—	
12500	Gt. No. Laxey (Isle of Man)*	0 15 0	—	
1000	Great N. Tolgus, c, Illogan	10 0 0	—	
1000	ditto	1 0 0	—	
3313	Gt. Wh. Baddern, t, Devoran	7 17 6	—	
119	Great Work, t, Germoe	100 0 0	—	
10240	Gunnislake (Clitters'), t, c	4 19 0	—	
6068	Gwydyr Park, l, Llanrwst	1 14 6	—	
6400	Harwood, l, Durham*	0 6 0	—	
6000	Hennock Iron Company	0 5 0	—	
2500	Laxey Neath Smelting Co.*	1 10 0	2¼	
1019	Leeds and St. Aubyn, t, c	19 13 4	—	
151	Levant, c, t, St. Just	10 8 1	—	
2325	Lonsdale Iron Co. [650 £5 pd., 1675 £3 pd.]			
5120	Lovell Consols, Wendron, t	0 3 0	⅜	
6000	Maudlin, c, Lostwithiel	4 7 0	—	
6000	Mid-Wales, s-l,*	1 10 0	—	
640	Mount Pleasant, l, Mold	4 0 0	—	
12800	Nether Hearth* [6400 £1 pd., 6400 2s. pd.]			
6000	New Birch Tor & Vitifer, t‡	1 13 6	—	
1500	New Chiverton, l, Perranz.	0 2 0	8s.	6s. 8s.
6000	New Clifford, c, Gwennap*	2 10 0	—	
24000	New Cornish [12000 £1 pd., 12000 15s. pd.]			
6400	N. Crow Hill, l, St. Stephen	3 4 0	—	
6514	New E. Russell, c, Tavistock	0 12 6	—	
20000	New Gt. Cons., c, Tavistock*	0 15 0	—	
3000	New Huntingdon, t, Devon	0 1 0	—	18s. 20s.
6400	New Pembroke, St. Blaz. t, c	1 7 0	—	
5755	New Treleigh, c, Redruth	4 8 0	—	
667	New Trevenen, t, Wendron	12 1 6	—	
4096	New Wh. Lovell, t, Wendron	1 10 0	½	
2000	N. Wh. Towan, c, t, Wendron	1 10 0	—	
16000	N. Devon, s-l, Combmartin	0 19 0	—	
5000	No. Dolcoath, c, Camborne	4 3 0	—	
1361	No. Grambler, c, Redruth	8 5 3	—	
6000	North Jane, t, s-l, Kenwyn	3 1 6	—	
2000	North Levant, t, c, St. Just	10 12 0	—	
4000	No. Phœnix, c, Linkinhorne	4 11 0	—	
3933	North Pool, c, Illogan	5 16 0	—	
1024	No. Retallack, c, Perrazabuloe	2 0 0	—	
1935	No. Shepherds, l, Newlyn*	6 10 0	—	
6000	North Wheal Basset, c, t‡	5 0 0	—	
6144	N.W. Robert, c, Smp. Spiney	4 8 11	—	
12288	Okel Tor, c, Calstock	2 7 4	18s.	
8000	Old Gunnislake, c, Calstock	2 15 0	—	
6400	Par Consols, c, St. Blazey†‡	2 14 6	—	
5000	Pendeen Consols, c, St. Just	6 11 0	—	
2720	Penhale Wh. Vor, t, c, Breage	4 2 6	—	
5000	Penhalls, t, St. Agnes	3 0 0	—	
1772	Polberro, t, St. Agnes	15 0 0	—	
12000	Redmoor, c, t, Callington	1 15 6	—	
6000	Reinnie Laxey, l, I. of Man*	4 0 0	—	
2000	Rosecliff and Tolcarne, l*	9 0 0	—	
3973	Rosewarne Cons., c, Gwinear	5 12 6	—	
5915	Rosewall Hill & Ransom, c	3 0 0	—	1½ 1⅝
3848	Rosewarne Un. c, t, Gwinear	4 3 0	—	
16000	Shropshire Copper, c*	2 10 0	—	
20500	Snaefell, l, Isle of Man*	1 0 0	—	
400	Silver Brook, s-l, Carmar.*	10 0 0	—	
12000	Sortridge Cons., c, Tavistk.†	1 18 6	—	
512	South Basset, c, Gwennap	27 0 0	9	7 9
3000	So. Chiverton, s, l, Perranz.	6 2 6	—	
6000	S. Dolcoath & Carnarth. Con.	2 16 6	—	
6000	So. Fowey, c, Tywardreath	0 10 0	—	
1024	So. Herodsfoot, l, Liskeard	11 10 0	—	
30210	South of Scotland, c*	1 0 0	—	
2739	South Trevenna, c, t	2 10 0	—	
937	So. Wh. Crofty, c, Illogan	24 10 10	16	15 16
6000	South Wheal Grenville, t, c	1 0 6	—	
400	So. Wh. Seton, c, Camborne	81 3 0	—	
59	Spearne Consols, t, St. Just	16 17 6	—	
242	Spearne Moor, t, St. Just	6 2 0	—	
673	St. Ives Wh. Allen, t, St. Ives	18 18 7	—	
8771	St. Just Amalg., t,* [6000 £3 10s. pd., 2771 £2 5s. pd.]			
300	Steeple Aston Iron Ore Co.	4 0 0	5½	
7000	Stiperstones, l, Salop*	5 0 0	—	
3500	Tin Hill, t, St. Austell	1 12 0	—	
501	Tresavean and Trethurrup.	16 11 0	—	
4440	Trevenen & Tremenheere	7 11 0	—	
4096	Trewetha, s-l, Menheniot	7 17 0	—	
1943	Treworlis, t, Wendron	11 15 4	—	
6400	Tyne Head, Northumb. t, c*	0 18 0	—	
4200	Vigra and Clogau, c, Dolg.*‡	5 10 0	—	
2500	West Briton, c, Crowan	1 0 0	—	
1319	West Cwm Erfin, l* [319 £4 paid]		—	
256	West Damsel, c, Gwennap	38 10 0	—	
12000	W. Maria & Fortes., c, Lam.	3 11 6	—	
12800	West Prince of Wales, c	0 10 0	⅜	
1000	West Rose Down, c, Linking.	19 15 0	—	
512	West Tolgus, c, Redruth	58 10 0	18	
512	W. Wh. Frances, t, Illogan	105 15 0	11	8 10
4096	W. Wh. Tremayne, c, St. Erth	0 6 0	—	
741	Wheal Basset and Grylls, t	7 18 6	—	
4000	Wh. Emma, c, Buckfastleigh	3 19 0	—	
6000	Wheal Emily, s, Callington	0 1 0	—	2 2¼
6000	Wheal Ida, s-l, St. Ive	1 3 0	⅜	
1024	Wh. Kitty, t, Uny Lelant†	3 10 6	—	
512	Wheal Jane, s-l, Kea	10 10 0	52½	
896	Wh. Margaret, t, Uny Le.‡	13 17 6	—	
728	Wheal Margery, St. Ives, t, c	26 14 0	—	
6000	Wheal Mary Florence, c*	2 2 0	—	
1000	Wh. Mary Hutchins, c, Plymp.	2 0 6	—	
80	Wheal Owles, t, St. Just‡	70 0 0	—	
6000	Wheal Sparnon, c, Redruth	3 12 0	—	
1920	Wh. Trannack, c, Sithney	1 13 3	—	
1200	Wheal Trevenna, t, c*	10 0 0	—	

MISCELLANEOUS.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.
60000	Anglo-American Telegrh.*†	10 0 0	19¼	18⅞ 19⅛
30000	Central American Associ.*†	1 0 0	⅞	⅝ ⅞
42000	Cop. Min. Eng.† [2000 £25 pd., 40000 £100 pd.]			
80000	Ebbw Vale Iron Co.*†	27 10 0	—	
70000	English and Australian, c‡	2 10 0	¾	¾ ⅞
4000	Hollybush Coll. and Coke*	5 0 0	—	
148525	London Gen. Omnibus*†	4 0 0	1¾	1½ 1⅝

b, blende; cl, coal; c, copper; g, gold; l, lead; s, silver; sl., slate; s-l, silver-lead; t, tin; z, zinc.

** Companies marked thus * have been incorporated with Limited Liability; those marked † have been admitted on the Stock Exchange, those marked thus ‡ have paid Dividends.

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